THE SECTOR REPORT ON THE EVALUATION OF THE 2024 UNIVERSITIES' RESEARCH OUTPUTS

March 2026

Evaluated in terms of the Research Outputs Policy, 2015

higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

Department of Higher Education and Training
123 Francis Baard Street
Pretoria
0001

Private Bag X174
Pretoria
0001

Tel (012) 312 5911
Fax (012) 323 5618
Website: http://www.dhet.gov.za

Published by the Department of Higher Education and Training

Copyright © Department of Higher Education and Training, 2026

Enquiries:
Director: Policy and Development Support
Telephone: 012 312 5446

FOREWORD BY THE DIRECTOR-GENERAL

The Sector Report on the Evaluation of the 2024 Universities' Research Outputs (the Report) provides a comprehensive overview of the research performance of South Africa's public universities for the 2024 reporting cycle. Institutions continue to demonstrate consistently strong performance in the production of peer-reviewed and scholarly outputs, including research articles in accredited journals, books and book chapters, and conference proceedings.

Over the past two decades, the sector has experienced sustained growth in research publication units, increasing from a baseline of **7.230** units in 2005 to **25 981.73** units in 2024. This represents a compound average growth rate of **6,69%** with a notable year-on-year increase of **9,27%** from 2023 to 2024. Each university represents a unique contribution to the collective pursuit of knowledge production in the South African higher education landscape.

The steady rise in approved research output units can largely be attributed to the professionalisation of university research offices and ongoing engagement with the Department of Higher Education and Training (the Department) on policy requirements. In addition, the transition to an online submission platform over the past five years has streamlined evaluation processes, improving the efficiency of submissions and strengthening sub-panels' capacity to conduct rigorous assessments.

The increased productivity at our universities reflects a steadfast commitment of our academics to advancing knowledge, fostering innovation, and therefore contributing meaningfully to local, regional, and global scholarly debates. It foregrounds the strength of the South African research ecosystem and the supportive research environment that enables our academics to thrive.

Despite these gains, concerns persist regarding research quality and practices that may compromise the integrity of the subsidy process. These systemic challenges require a coordinated sector-wide response. In this context, the Department has introduced the Publication Quality Framework (PQF), developed in collaboration with universities. The PQF establishes mechanisms to detect unethical research practices early and prevent non-compliant outputs from entering the subsidy system. It safeguards public funds by ensuring that only legitimate, high-quality research receives state support, thereby reinforcing the core mandate of the Research Output Policy (2015).

The Department sincerely thank the appointed panel of experts and the National Research Foundation for their invaluable expertise, guidance and continued commitment. Their contributions are fundamental to the success and integrity of this work.

The Department remains confident that by working together, the sector will overcome these systemic challenges. Our goal remains clear, to sustain a vibrant, relevant and globally competitive higher education system that serves the best interests of South Africa.

Dr Nkosinathi Sishi
Director-General: Department of Higher Education and Training
Date: 2024 / 07 / 25

Table of Contents

1. INTRODUCTION: PROCESS AND PROCEDURE *10*
1.1. The process *10*
1.2. Methodological notes *11*
1.2.1 Publication output units and publication outputs *12*
1.2.2 Classification of outputs by scientific field or discipline *12*
1.2.3 The definition and meaning of normalised indicators used in the report *12*
1.2.4 The analysis of demographic trends in publication output *12*
1.3. Quality and Integrity of Research Outputs *13*
2. OVERALL RESEARCH PUBLICATIONS OUTPUT *14*
2.1. Overview and trends *14*
2.2. Publications units by publication type *15*
3. JOURNAL ARTICLE OUTPUTS *19*
3.1. Overview of journal articles *19*
3.2. Journal articles disaggregated by Index or Journal List *22*
3.3. Journal articles by scientific field *25*
4. BOOK AND BOOK CHAPTER OUTPUTS *26*
4.1. Overview and trends *26*
4.2. Book and book chapter outputs by university *28*
5. PUBLISHED CONFERENCE PROCEEDINGS *32*
5.1. Overview and trends *32*
6. NORMALISED RESEARCH OUTPUT INDICATORS *36*
6.1. Per capita research publication output *36*
6.2. Weighted per capita research output *38*
6.3. Proportion of academic staff with doctorates *41*
6.4. Ratio of doctoral graduates to academics with a doctorate *41*
7. DEMOGRAPHIC TRENDS *44*
7.1. Publication outputs by gender of author *44*
7.2. Publication outputs by country of birth of the author *45*
7.3. Publication outputs by race of author *46*

7.4. Publication outputs by age of author.....47
8. GENERAL OBSERVATIONS AND CONCLUSIONS.....51

List of figures

Figure 1: Total Publication Units awarded, 2005 – 2024

Figure 2: Percentage Growth Rate and 3-year Cycles of CAGR, 2005 - 2024

Figure 3: Relative cumulative share to sector output by individual universities

Figure 5: Increase in the number of journals in which SA academics published (2005 - 2024)

Figure 6: Trend in the number of journal article output units, 2005 – 2024

Figure 7: Comparing articles units awarded with articles by main subject field

Figure 8: Trend in book and book chapter output from 2005 to 2024

Figure 9: Comparing book and book chapter units awarded for 2023 and 2024 by university

Figure 10: Trends in the production of published conference proceedings between 2005 and 2024

Figure 11: Comparison of conference proceeding units awarded for 2023 and 2024 by university

Figure 8: Trend in Per Capita Publications Output and Weighted Research and Normalised Weighted Research Output 2005 – 2024

Figure 13: Trend in percentage of staff with doctorate degrees from 2005 to 2024

Figure 14: Gender of authors of journal articles: 2005 - 2024

Figure 15: Percentage of authorships produced by South African nationals: 2005 to 2024

Figure 16: Percentage of authors by race (SA nationals only) between 2005 and 2024

Figure 17: Trend in age of authors 2005 to 2024

List of tables

Table 1: Publication output units by publication type by universities, 2024
Table 2: CAGR by rolling three-year windows for journal articles, 2007–2024
Table 3: Articles by Index, 2024 (n=32 748)
Table 4: Number of Articles by Scientific Fields, 2005 to 2024
Table 5: CAGR by rolling three-year windows for books and chapters, 2007-2024
Table 6: Percentage of book publications output units by university, 2022 and 2024
Table 7: CAGR of book publications units by university, 2015 - 2024
Table 8: CAGR values for growth rates in annual published conference proceedings (2005 to 2024)
Table 9: Published Conference Proceedings Units per university, 2015 – 2024
Table 10: Per capita research publications outputs, 2024
Table 11: Weighted per capita research output (2024)
Table 12: Number of permanently employed academics by highest qualification, 2024
Table 13: Ratio of doctoral graduates to doctorate staff member by university (2024)
Table 14: Supervisory load per doctorate academic staff by university (2024)
Table 15: Trend in race of authors of journal articles 2005 to 2024
Table 16: Trend in age of authors 2005 to 2024

ACRONYMS

CAGR	Compound Average Growth Rate
CESM	Classification of Educational Subject Matter
CPUT	Cape Peninsula University of Technology
CUT	Central University of Technology
DHET/ the Department	Department of Higher Education and Training
DOAJ	Directory of Open Access Journal
DUT	Durban University of Technology
HEMIS	Higher Education Management Information System
IBSS	International Bibliography of Social Science
ISBN	International Standard Book Number
ISI	Institute of Science Information
MUT	Mangosuthu University of Technology
NMU	Nelson Mandela University
NRF	National Research Foundation
NWU	North-West University
ROSS	Research Outputs Submission System
RU	Rhodes University
SciELO SA	Scientific Electronic Library Online South Africa
SMU	Sefako Makgatho Health Sciences University
SPU	Sol Plaatje University
SUN	Stellenbosch University
TUT	Tshwane University of Technology
UCT	University of Cape Town
UFH	University of Fort Hare
UFS	University of the Free State
UJ	University of Johannesburg
UKZN	University of KwaZulu-Natal
UL	University of Limpopo
UNISA	University of South Africa
UNIVEN	University of Venda
UNIZULU	University of Zululand
UP	University of Pretoria
UWC	University of the Western Cape
VUT	Vaal University of Technology
WITS	University of the Witwatersrand
WoS	Web of Science
WSU	Walter Sisulu University

1. INTRODUCTION: PROCESS AND PROCEDURE

1.1. The process

The Department of Higher Education and Training (the Department) implements the *Research Output Policy (the Policy) (2015)*, which provides a framework for the evaluation and subsidy allocation of research outputs produced by South African public higher education institutions (universities). The subsidisation of research outputs forms a basis for sustaining research and promoting increased research productivity and other forms of knowledge generation required to meet national development needs. The Policy recognises three types of publications: journal articles, book publications and published conference proceedings. The Policy relies on the peer-review principle, among others, to ensure the quality of academic publications.

The Policy accords all South African universities with the responsibility to co-own its implementation and to ensure the improvement of the quality of research output from the sector. To reduce errors, institutions are required to ensure that all research office personnel are well acquainted with the Policy; and that an institutional panel assesses all publications before submission to the Department as per paragraph 8.2 (d) of the Research Outputs Policy and that all are familiar with the general requirements, principles, objectives and ethics upon which the policy is set. Only claims that meet the policy requirements must be submitted to the Department.

All 26 universities submitted their research publications for subsidy claims on or before 15 May 2025. The Directorate: University Research Support and Policy Development (the Directorate), together with the National Research Foundation (NRF), administered the process and evaluated the technical compliance of all submissions. The Research Outputs Submission System (ROSS), developed and managed by the NRF, facilitates online research output submissions and their processing through to the outcomes of evaluations by relevant field-specific expert peer review sub-panels. These sub-panels use pre-determined evaluation criteria in line with the Policy. The sub-panellists are drawn from the university sector and are expert practitioners in their respective fields. They conducted evaluations of books, book chapters, and conference papers under the guidance of the respective sub-panel Chairpersons.

The online submission and evaluation of research outputs have proven convenient and efficient, as evaluations were completed by the due date of 25 July 2025. It also enabled a quicker, more thorough evaluation process over recent years.

The Policy requires institutions to submit audited subsidy claims for research outputs appearing in approved journal indexes and lists. The Department recognises the following lists: Scopus; Scientific Electronic Library Online South Africa (SciELO SA); the Norwegian Register for Scientific Journals; Clarivate (formerly Thomson Reuters) Web of Science; the ProQuest International Bibliography of the Social Sciences (IBSS), and the Department of Higher Education and Training (DHET) list of South African journals.

The process followed for evaluating the 2024 research outputs was as follows:

a) The Department received all electronic copies of publications, including books, book chapters, conference papers, audited journal articles, and the required supporting documentation, in May 2025.
b) The Department screened all the submissions for eligibility according to the technical criteria as per the Policy.
c) Field-specific sub-panel evaluations were convened from 14 to 25 July 2025 and evaluated research outputs according to predetermined criteria and the scholarship of the publications.
d) The Department, supported by the NRF, analysed the outcomes of the sub-panels and calculated the number of units allocated to each institution for publications in books and conference proceedings.
e) Audited claims for publications in accredited journals submitted by universities were checked and verified against accredited and recognised journal indexes and lists, and final unit allocations for each institution were calculated.
f) Individual institutional reports were developed by the Department and sent to the respective institutions in December 2025.
g) This Sector Report on the Evaluation of 2024 Universities' Research Outputs was drafted by the Department, with assistance from the Centre for Research, Evaluation, Science and Technology (CREST) on statistical analysis and quality.

Late publications for the year 2022 (n-2) were considered where valid and legitimate reasons for late submission were provided and accepted, but publications dated on or before 2021 (n-3 and beyond) were not considered, as stipulated in the Policy. For the sake of pattern analysis and improving its systems, the Department will, in the future, request a separate submission of n-3 publications and articles appearing in non-approved publications. However, these will still not be considered for subsidy.

1.2. Methodological notes

Several methodological clarifications are in order with regard to:

- The distinction between publication output units and publication outputs
- The classification of scientific fields/disciplines
- The definition and meaning of normalised indicators used in the Report
- The analysis of demographic trends in publication output

1.2.1 Publication output units and publication outputs

This Report makes a distinction between publication output **units** and publication **outputs**. The former refers to the subsidy units awarded for each approved publication (according to the criteria set out in the Policy) based on the submissions made in a particular year. This means that a university is awarded a total subsidy amount based on all submissions made in 2025 for the preceding year (2024). However, as the Policy allows late submissions with valid reasons (i.e., 2023 — 1 year or year n minus 1), the result is that the total subsidy units awarded in 2025 for 2024 publications will inevitably include a small proportion of publications published in 2023. In this Report, the total number of subsidy units (or output units) that have been awarded to universities based on the submissions made in 2025 is reported at the beginning of each section. When results are reported by a scientific field, a journal index, or demographics, the analyses are based on the actual **publication year** of each output rather than the submission year.

1.2.2 Classification of outputs by scientific field or discipline

The analysis of outputs by scientific field is based on an international classification framework of high-level scientific fields, which are typically used in bibliometric databases such as Web of Science and Scopus. The outputs as submitted have been matched to CREST's field classification framework, which is a customised version of the international classification systems.

1.2.3 The definition and meaning of normalised indicators used in the report

The results of analyses of four normalised indicators are included in the report:

- Per capita research **publication output** (where the total number of publications by a university is divided by the headcount of the permanent instructional and research staff in the same year). The result is the number of publications per permanently employed academics per annum.
- Weighted per capita **research output** (where all research output - including research master's and doctoral graduates - is calculated against set norms and divided by the headcount of academic staff in the same year). Each research master's graduate has a weight of 1 unit, while a doctoral graduate has a weight of 3 units.
- Proportion of academic staff with PhD degrees (included as a proxy of staff quality).
- Proportion of doctoral graduates per doctoral academic staff (included as a proxy of supervisory capacity at a university).

1.2.4 The analysis of demographic trends in publication output

This report includes several analyses of demographic shifts in universities' publication outputs. The report includes four demographic variables used in these analyses:

- Gender of the author
- Country of birth of the author (SA-nationals and foreign nationals)
- Race of the author (SA nationals only according to the Employment Equity Act)
- Age of the author

The analyses of the above categories are based on data sourced from the most recent submissions. It is important to note that coverage of these variables in the current version of the database at CREST varies (for example, 'gender of author' is much better covered than 'nationality of the author'). However, in all cases, information on these variables is available for more than 90% of the individual records used in the final analyses.

The purpose of analysing demographic patterns is to assist the Department in monitoring trends in the transformation of knowledge production in the university sector, particularly the development of young academics into experienced researchers. Such knowledge assists the Department in designing the necessary interventions, for example, in the University Capacity Development Plan (UCDP). Understanding shifts in the above-stated demographics over time is imperative if the Department and the individual institutions are to contribute to the redress and transformation of our country.

1.3. Quality and Integrity of Research Outputs

The Department remains committed to ensuring that an appropriate framework is in place to assure the quality and integrity of academic publications. There is currently such an initiative (The University-led Collaborative Programme on a Publication Quality Framework (PQFP) under the auspices of the UCDP

and led by CREST at Stellenbosch University (SUN)) to strengthen existing frameworks and procedures. The Department will continue to communicate with the sector on these initiatives and any changes that may be required in the future, to ensure that the subsidy system is guarded against abuse and only publications of high quality and ethical integrity are subsidised. As stated before, the Department reserves the right to withhold payment of the research output subsidy in respect of any publication unit that does not meet the criteria outlined in the research output policy, violates international rules on research integrity and ethics, or fails to uphold acceptable academic practices of good scholarship.

The purpose of the Research Outputs Policy is to "encourage research productivity by rewarding quality research outputs at public higher education institutions". The emphasis must be put on 'quality' research and publications. Each year, the Department scrutinises the quality of submissions made by institutions. Such scrutiny has helped improve the policy, processes, and procedures for the submission and determination of subsidy allocations.

Institutional reports for the 2025 submissions include information about publication units that were withheld from the 2024 submissions (2023 publications) pending an investigation. Based on subsequent analyses and investigations, some submissions were declined in 2024 and are not included in this Report.

2. OVERALL RESEARCH PUBLICATIONS OUTPUT

2.1. Overview and trends

A total of 25 981.73 publication subsidy units in all publication categories (journal articles, books, book chapters and published conference proceedings) were awarded to universities for the 2025 submission cycle (2024 publication year). This constitutes a 9.27% increase from the 2024 publication units, from 23 777.63 to 25 981.73 units (or an increase of 2 204.1 units). **Figure 1** presents the timeline of approved publications units generated by the university sector for the past 20 years.

South African university research output (as measured by this subsidy-eligible unit system) has shown substantial growth since the mid-2000s, increasing by almost fourfold over the last 20 years. The output flattened briefly during the 2024 reporting period (2023 publication year) but has since resumed an upward momentum. The graph reflects the now-familiar trend of increasing output volume each year. However, it is important to point out that there is increasing evidence that the pursuit of quantity is occurring alongside greater gaming of the system, as well as increased publication in lower-quality journals that promise quick turnaround times for manuscripts. The *Research Outputs Policy (2015)* is very clear that the subsidy system must **not** pursue increased output at the expense of quality and integrity. The PQFP referred to above is currently investigating cases where universities are not in compliance with these goals and guidelines.

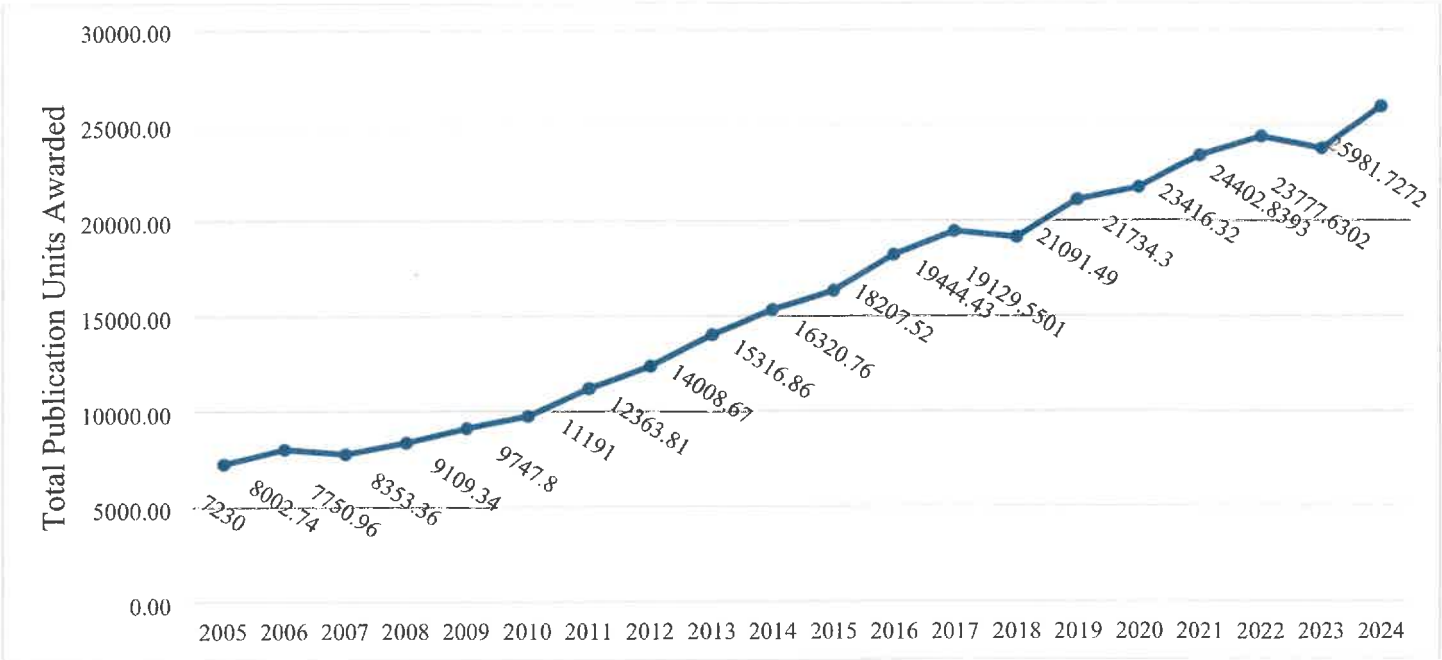


Figure 1: Total Publication Units awarded, 2005 – 2024

A better understanding of the overall trend can be achieved by focusing on the rate of growth in publications as measured by the Compound Average Growth Rate (CAGR) shown in **Figure 2**. The CAGR (compound annual growth rate) is calculated from previous growth rates and is reported here in three-year periods.

The overall percentage growth rate (CAGR) of research publications outputs from 2005 to 2024 was 6.96%.

The year-to-year growth in publication outputs over the past 12 years peaked at 14.81% in 2011. Further disaggregation of the CAGR into three-year timeframes (**Figure 2**) explains the differences in trends in publication output over the past 19 years. The CAGR value for 2008, for instance, represents compound growth between 2005 and 2008, and so on. The compound growth rate of publications output peaked at 12.62% between 2010 and 2012, following a period of strong growth, with double-digit annual growth recorded in 2011 and 2012. Since then, the rate has steadily decreased, from ~11–12% in the late 2000s/early 2010s toward ~3–4% currently.

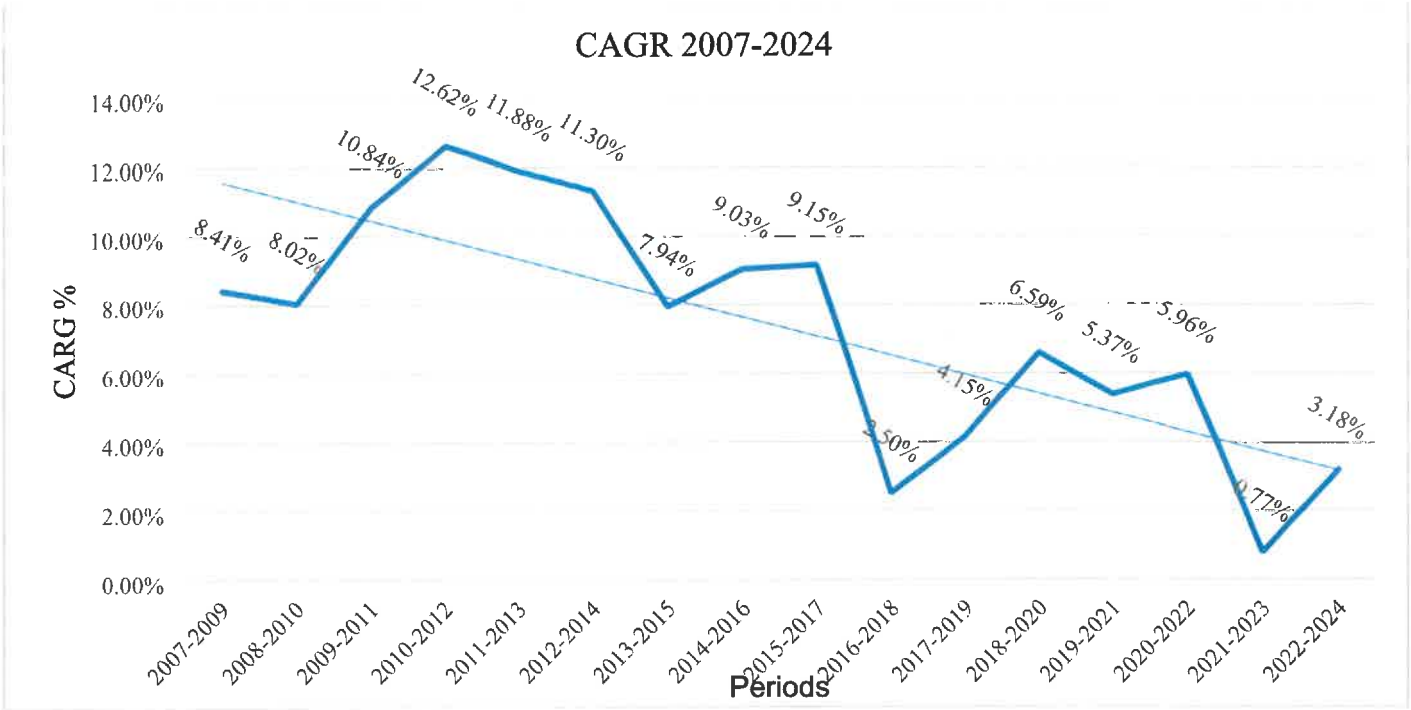


Figure 2: Percentage Growth Rate and 3-year Cycles of CAGR, 2005 - 2024

2.2. Publications units by publication type

The Research Outputs policy recognises book publications (i.e., books and book chapters), and published peer-reviewed conference proceedings and journal articles in approved lists of journals. The output units awarded for 2024 publications by each type and by university are listed in **Table 1** (in descending order by university).

Table 1: Publication output units by publication type by universities, 2024

Institution	Books		Conferences		Journals		Overall Institutional units 2023	Overall Institutional units 2024	% Share of Overall Sector units 2024
	Units	% of institutional units	Units	% of institutional units	Units	% of institutional units			
CPUT	25.5	0.82%	25.8	2.22%	290.7	1.34%	312.1	342.0	1.32%
CUT	25.6	0.82%	32.3	2.78%	225.3	1.04%	181.9	283.2	1.09%
DUT	67.9	2.18%	60.6	5.22%	534.8	2.46%	575.4	663.4	2.55%
MUT	4.6	0.15%	5.5	0.47%	70.5	0.32%	104.6	80.6	0.31%
NMU	49.8	1.60%	29.5	2.54%	405.1	1.87%	516.9	484.3	1.86%
NWU	226.6	7.28%	88.4	7.62%	1555.4	7.16%	1754.8	1870.4	7.20%
RU	57.9	1.86%	19.6	1.69%	418.6	1.93%	507.9	496.0	1.91%
SMU	0.2	0.01%	2.0	0.18%	333.8	1.54%	284.2	336.1	1.29%
SPU	5.9	0.19%	6.4	0.56%	76.5	0.35%	64.3	88.8	0.34%
SUN	309.5	9.95%	87.0	7.49%	1772.2	8.16%	2034.8	2168.6	8.35%
TUT	23.9	0.77%	55.2	4.75%	527.3	2.43%	461.5	606.3	2.33%
UCT	134.9	4.34%	50.2	4.32%	1356.7	6.25%	1613.6	1541.8	5.93%
UFH	48.6	1.56%	7.5	0.65%	301.9	1.39%	267.9	358.1	1.38%
UFS	319.0	10.25%	31.5	2.72%	1102.0	5.08%	1365.4	1452.5	5.59%
UJ	483.2	15.53%	248.9	21.44%	2780.6	12.81%	3195.1	3512.7	13.52%
UKZN	208.6	6.71%	29.1	2.51%	1869.4	8.61%	2344.4	2107.1	8.11%
UL	42.3	1.36%	14.9	1.28%	605.1	2.79%	588.2	662.3	2.55%
UMP	5.6	0.18%	2.4	0.21%	86.5	0.40%	65.1	94.5	0.36%
UNISA	274.6	8.83%	112.2	9.66%	2221.6	10.23%	1807.2	2608.3	10.04%
UNIVEN	20.8	0.67%	4.7	0.40%	278.0	1.28%	256.4	303.5	1.17%
UNIZULU	26.0	0.84%	14.4	1.24%	287.9	1.33%	246.8	328.3	1.26%
UP	285.8	9.19%	78.3	6.75%	1714.4	7.90%	2056.0	2078.5	8.00%
UWC	150.2	4.83%	17.5	1.51%	580.9	2.68%	690.4	748.5	2.88%
VUT	25.3	0.81%	24.5	2.11%	154.7	0.71%	191.7	204.5	0.79%
WITS	268.2	8.62%	88.4	7.62%	1649.4	7.60%	1969.7	2006.1	7.72%
WSU	20.5	0.66%	24.0	2.07%	510.6	2.35%	321.3	555.1	2.14%
Total	**3110.9**	100.00%	**1160.9**	100.00%	**21709.9**	100.00%	**23777.6**	**25981.7**	**100.00%**

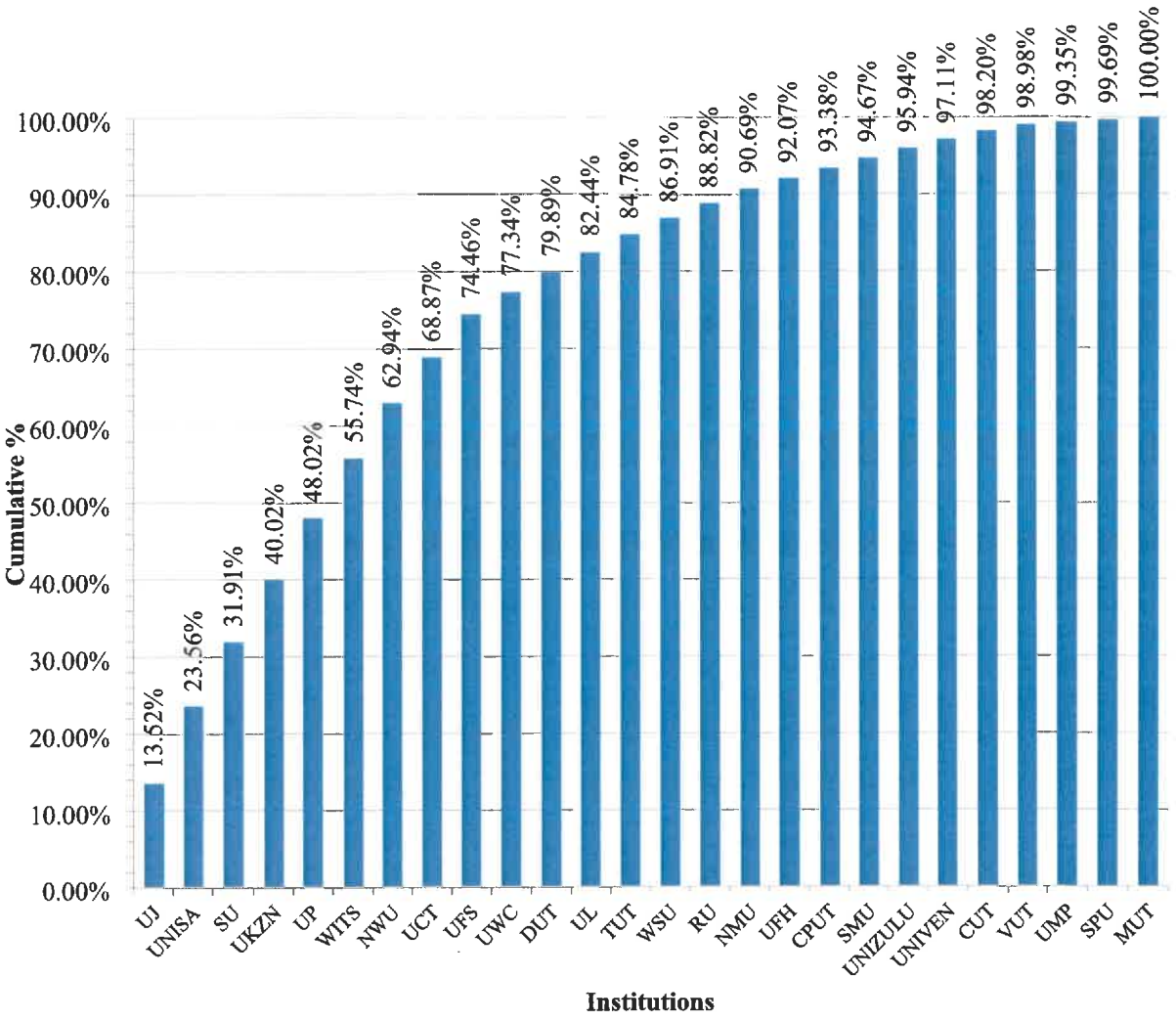
A graphic presentation of the cumulative relative share of sector output by individual universities is presented in **Figure 3.** The graph shows that half (48.02%) of the research publications output units were produced by five universities in the sector, whilst three-quarters (74.46%) of all output was produced by only nine universities. These trends, which have not fundamentally changed over the past two decades, show significant differentiation in the sector's knowledge-productive capacity. Although there have been major changes across the sector, such as the substantial growth in publications outputs since the Policy came into effect (2005), the proportional contribution of institutions has remained mostly unchanged. This should be of concern if the Policy has explicitly intended to contribute to a

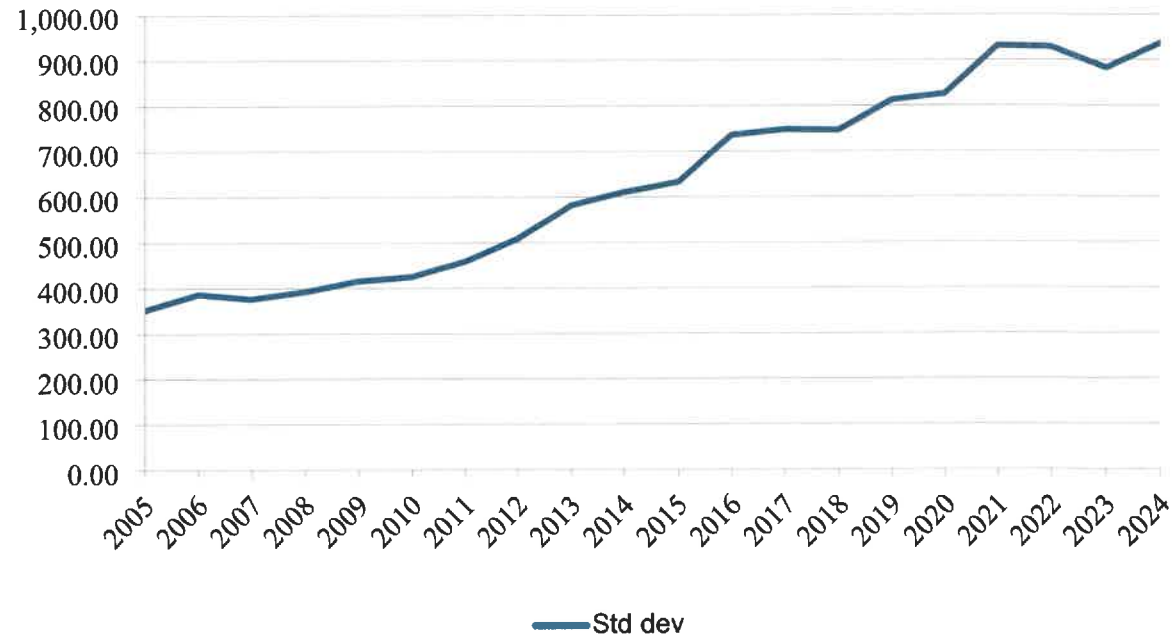
more equitable Higher Education (HE) system in knowledge production. The trends show that the gap in absolute outputs between the top 10 or more universities and the bottom 10 or more is larger than ever. Stated differently, an unintended consequence of implementing the Policy has been the creation of **a more unequal public university** system in terms of resourcing for knowledge production. This is an issue which is currently being addressed by the PQFP and will most likely result in recommendations to the current Policy.

Figure 3: Relative cumulative share to sector output by individual universities

Figure 4 illustrates the growing inequity in the publication output between universities. This graph plots the standard deviation (Std dev) of research output units (DHET subsidy units) across South African public universities from 2005 to 2024. The standard deviation measures the dispersion or inequality in how these units are distributed across universities. A higher value indicates greater spread: some institutions claim far more units than others (high inequality/concentration). A lower value means a more even distribution. The Standard deviation rises from 351.3 units in 2005 to 937.03 units by 2024 (roughly 2.5× increase over 20 years). While the DHET subsidy policy has driven strong overall growth in research production, it has also amplified existing inequalities. The "Matthew effect" (the rich get richer) appears to be at play: well-resourced institutions compound advantages through better hiring, paying large incentives to staff to publish as many papers as possible, recruiting more post-docs and visiting fellows, and thereby creating an unfair competitive situation in the sector.

Figure 4: Standard deviation in research output units (2005 – 2024)





The system's performance areas are captured in the following subsections of the report.

3. JOURNAL ARTICLE OUTPUTS

3.1. Overview of journal articles

Coupled with the growth of publication outputs from the sector, the addition of more journal indexes and lists in the 2015 revision of the Policy provided academics with a broader range of publication outlets for journal articles. **Figure 4** shows the increase in the number of journals in which South African academics have published in the past 20 years. The inclination of the graph from 2016 is a function of the inclusion of new indexes (predominantly Scopus) as well as the expansion of journals indexed across all indexes. It is of interest that the total number of journals in which South African academics published in 2024 (8124) represents only about 17% of the overall number of journals in the hitherto recognised seven indexes (WoS, IBSS, Scopus, Norwegian List, SciELO SA, DOAJ and DHET List).

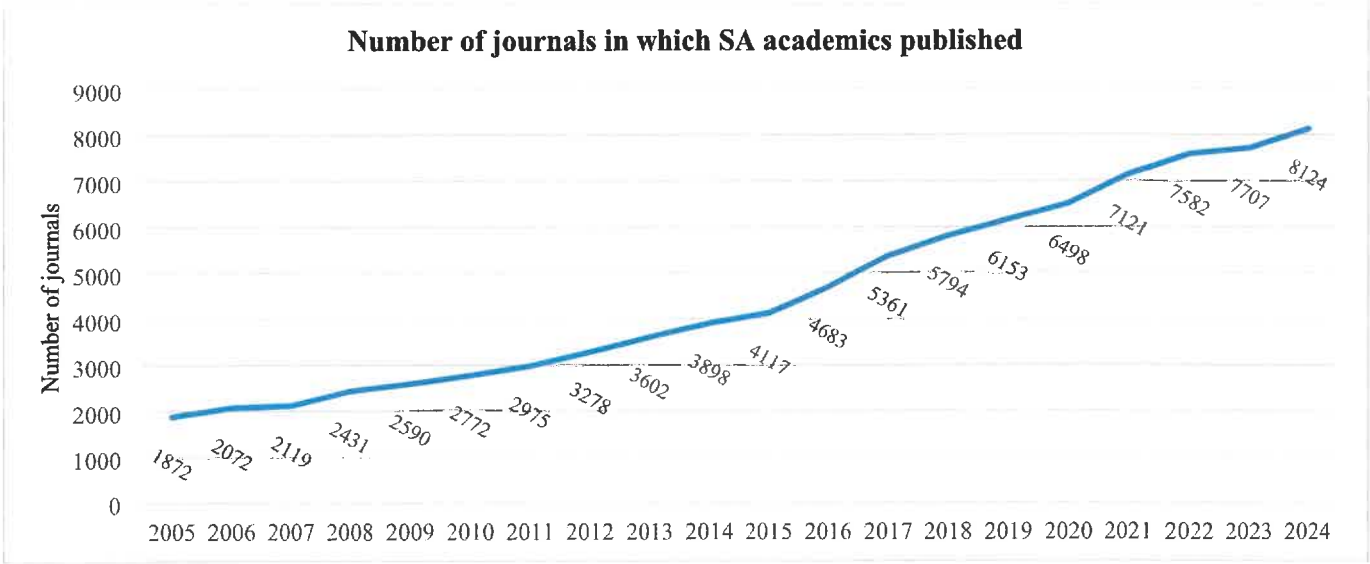


Figure 4: Increase in the number of journals in which SA academics published (2005 - 2024)

Journal articles are the predominant mode of knowledge dissemination across most scientific fields and disciplines, accounting for more than 80% of total publications in recent years. **Figure 5** shows the trend of units awarded for journal article outputs since 2005, with the overall growth representing a threefold increase over 20 years (2005–2024).

A marked increase in the number of article units was recorded from 2019 (journal publications of 2018) to 2020 (publications of 2019), that is, two years after the addition of new indexes. The new indexes and lists started to be analysed in the 2017 report (publications of 2016). This shows that the expansion of the indexes, with additional journals introduced in 2016, did not have an immediate impact on the number of units (which could have been observed in the 2017 report of 2016 publications). However, the annual number of articles published peaked in 2022 and decreased slightly in 2023. This can likely be attributed to the COVID-19 aftermath: disrupted research, peer-review delays, lab/fieldwork halts, heavy teaching/online loads, and reduced output in many institutions. Some shift toward books/chapters, or toward lower-volume formats, during lockdowns. In 2024, we observed the largest single-year increase over the entire period: 2,071.41 units, representing an annual growth rate of 10.55%. This trend can be partly attributed to the recovery in publishing pipelines and adaptation to post-COVID research environments, but also the persistent above-average growth in some institutions (e.g., University of Johannesburg and UNISA recording a 13.5 % and 47.6% annual growth, respectively).

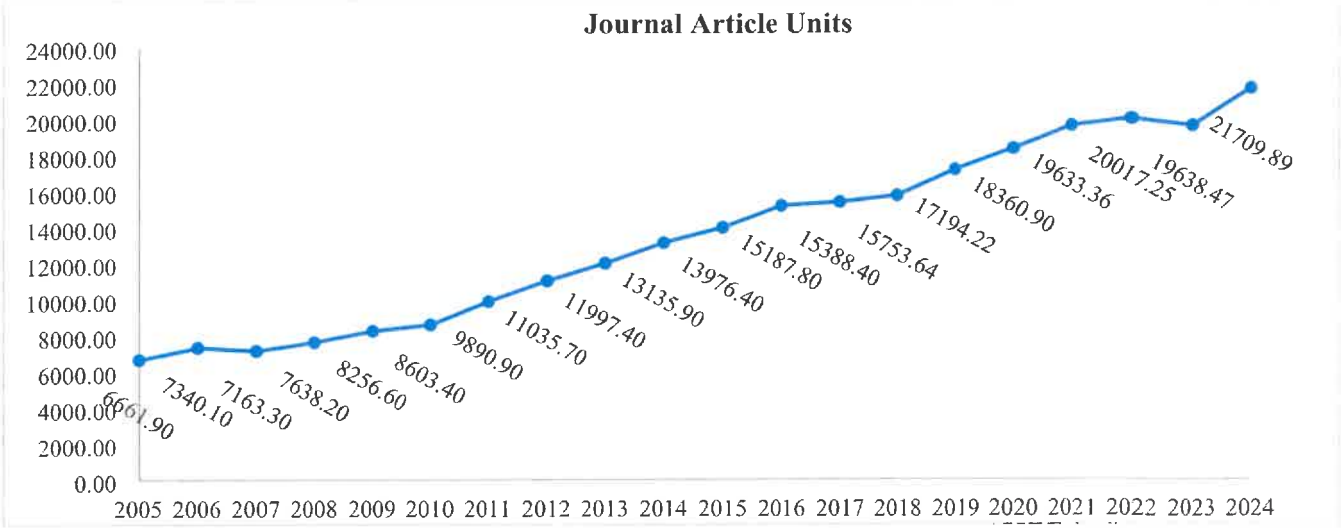


Figure 5: Trend in the number of journal article output units, 2005 – 2024

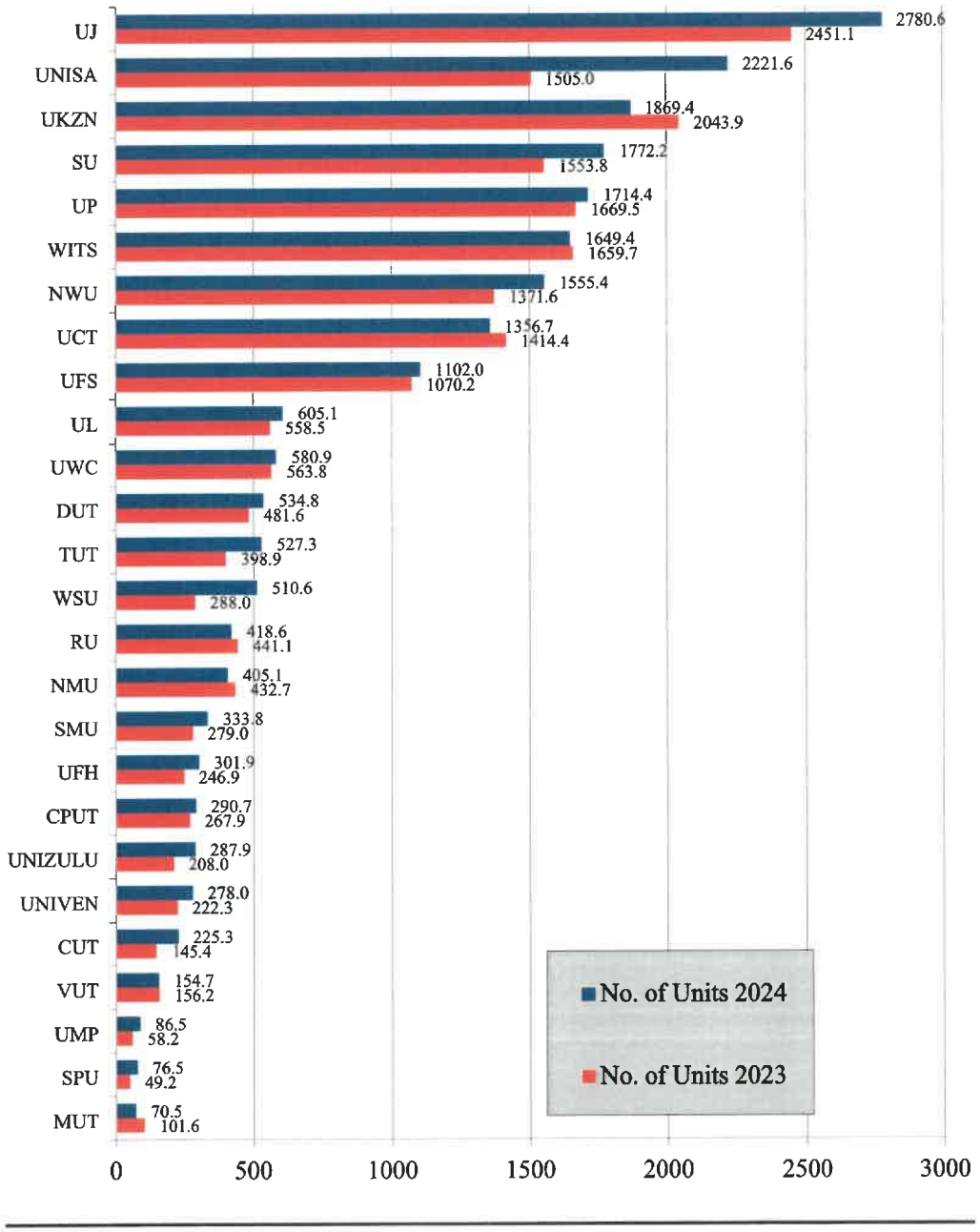
The Compound Average Growth Rate -values over this period are presented in **Table 2**. The three-year CAGR presented in **Table 2** provides an overview of the article output performance trends, including changes in publication output over the past 20 years.

Table 2: CAGR by rolling three-year windows for journal articles, 2007–2024

Publication Year	Journal Article Units	Annual Growth	3Yr CAGR
2005	6661.90		
2006	7340.10	10.18%	
2007	7163.30	-2.41%	
2008	7638.20	6.63%	4.66%
2009	8256.60	8.10%	4.00%
2010	8603.40	4.20%	6.30%
2011	9890.90	14.97%	9.00%
2012	11035.70	11.57%	10.15%
2013	11997.40	8.71%	11.72%
2014	13135.90	9.49%	9.92%
2015	13976.40	6.40%	8.19%
2016	15187.80	8.67%	8.18%
2017	15388.40	1.32%	5.42%
2018	15753.64	2.37%	4.07%
2019	17194.22	9.14%	4.22%
2020	18360.90	6.79%	6.06%
2021	19633.36	6.93%	7.61%
2022	20017.25	1.96%	5.20%
2023	19638.47	-1.89%	2.27%
2024	21709.89	10.55%	3.41%

The year-to-year comparison of the number of article subsidy units awarded per university is shown in **Error! Reference source not found.**.

Figure 7: Article units awarded by university



3.2. *Journal articles disaggregated by Index or Journal List*

The inclusion of new indexes after the 2016 review of the policy began to have a clear effect on publication output from 2019 onwards. The newly added indexes from 2016 are **Scopus**, Scientific Electronic Library Online South Africa (**SciELO SA**), and the Norwegian Register for Scientific Journals, Series and Publishers and since 2021, the Directory of Open Access Journals (DOAJ). **Table 3** presents the breakdown of journal output by journal index or list.

Table 3: Articles by Index, 2024 (n=32 748)

DHET	WoS	Scopus	DOAJ	IBSS	SciELO	Norwegian List*	Number of articles	Percentage
YES	YES	YES	YES	YES	YES	YES	2	0.01
YES	YES	YES	YES	YES	YES		46	0.14
YES	YES	YES	YES	YES			1	0
YES	YES	YES	YES		YES	YES	20	0.06
YES	YES	YES	YES		YES		626	1.92
YES	YES	YES	YES				8	0.02
YES	YES	YES		YES			32	0.1
YES	YES	YES			YES		32	0.1
YES	YES	YES					237	0.73
YES		YES	YES	YES	YES		138	0.42
YES		YES	YES	YES			54	0.17
YES		YES	YES		YES		1027	3.14
YES		YES	YES				129	0.39
YES		YES		YES			49	0.15
YES		YES					250	0.77
YES			YES	YES	YES		3	0.01
YES			YES	YES			6	0.02
YES			YES		YES		531	1.63
YES			YES				287	0.88
YES				YES			60	0.18
YES					YES		119	0.36
YES							**747[1]**	**2.29**
	YES	YES	YES	YES		YES	11	0.03
	YES	YES	YES	YES			69	0.21
	YES	YES	YES		YES		152	0.47
	YES	YES	YES			YES	531	1.63
	YES	YES	YES				4863	14.89
	YES	YES		YES		YES	207	0.63
	YES	YES		YES			671	2.05
	YES	YES			YES		45	0.14
	YES	YES				YES	2031	6.22

[1]DHET only

DHET	WoS	Scopus	DOAJ	IBSS	SciELO	Norwegian List*	Number of articles	Percentage
	YES	YES					7683	23.52
	YES		YES			YES	17	0.05
	YES		YES				127	0.39
	YES					YES	43	0.13
	YES						**34[2]**	**0.1**
		YES	YES	YES	YES		84	0.26
		YES	YES	YES			146	0.45
		YES	YES		YES		10	0.03
		YES	YES			YES	1	0
		YES	YES				2880	8.82
		YES		YES		YES	2	0.01
		YES		YES			534	1.63
		YES			YES		5	0.02
		YES				YES	39	0.12
		YES					**3828[3]**	**11.72**
			YES	YES	YES		5	0.02
			YES	YES			162	0.5
			YES		YES		28	0.09
			YES				**3154[4]**	**9.66**
				YES			**901[5]**	**2.76**
						YES	**3[6]**	**0.01**
							78[7]	0.24

* *Norwegian Register for Scientific Journals, Series and Publishers*

All journal articles are linked to a specific journal that is indexed or listed in one or more of the DHET-approved journal indexes or lists. The results show the dominance of two indexes: Scopus and the [CA]Web of Science. More than half (52.7%) of all journal articles in 2024 were published in either of

[2]WoS only

[3]Scopus only

[4]DOAJ only

[5]IBSS only

[6]Norwegian list only

[7]Articles not found on any index

these indexes. Articles published in Scopus-listed journals **only** constitute 11.72% of all articles published. The next-largest component is DOAJ-listed journals (9.66%). The Norwegian list again included the fewest unique index articles published at 0.01% of the total journal articles. Publications exclusive to the DHET-listed journals declined from 5.16% in 2020 to 2.29% in 2024. It is worth noting that 80.7% of all publications overlap with Scopus and 53.4% overlap with WoS.

The inclusion of DOAJ in 2021 has had a significant impact, with 9.66% of publications being exclusive to DOAJ and 46.2% overlapping with other indexes.

3.3. Journal articles by scientific field

Table 4 (overleaf) presents the number of articles by scientific fields. The number of articles assigned to the Social Sciences and Agricultural Sciences showed strong growth in 2024 with an annual increase of 18.22% and 19.72%, respectively, while article outputs in Engineering, Humanities and the Arts, Natural Sciences and Medical and Health Sciences remained constant.

Table 4: Number of Articles by Scientific Fields, 2005 to 2024

Domains	2005	2010	2015	2023	2024	CAGR (2005-2024)	Annual Growth
Agricultural and veterinary sciences	644	937	1341	1070	1281	3.69%	19.72%
Engineering and Technology	741	1264	2217	3156	3394	8.34%	7.54%
Medical and Health Sciences	2118	3589	5766	7263	7419	6.82%	2.15%
Humanities and the Arts	1507	2089	2483	2057	2215	2.05%	7.68%
Natural sciences	2322	4019	6272	9280	10004	7.99%	7.80%
Social sciences	1849	3009	5776	7954	9403	8.94%	18.22%
Grand Total	**9226**	**15093**	**24473**	**30780**	**33716**	**7.06%**	**9.54%**

*1. **Agricultural and Veterinary Sciences**: (Agriculture, forestry, and fisheries; Animal and dairy science; Veterinary science; Agricultural biotechnology and other agricultural sciences)*

*2. **Engineering and Technology**: (Civil engineering; Electrical engineering, electronic engineering, information engineering; Mechanical engineering; Chemical engineering; Materials engineering; Medical engineering; Environmental engineering; Environmental biotechnology; Industrial biotechnology; Nano-technology and other engineering and technologies).*

*3. **Medical and Health Sciences**: (Basic medicine; Clinical medicine; Health sciences; Medical biotechnology and other medical science)*

4. Humanities and the Arts: (History and archaeology; Languages and literature; Philosophy, ethics and religion; Arts (arts, history of arts, performing arts, music) and other humanities)

*5. **Natural Sciences**: (Mathematics; Computer and Information Sciences; Physical Sciences; Chemical Sciences; Earth and Related Environmental Sciences; Biological Sciences and other natural sciences).*

*6. **Social Sciences**: (Psychology and cognitive sciences; Economics and business; Education; Sociology; Law; Political science; Social and economic geography; Media and communications and other social sciences)*

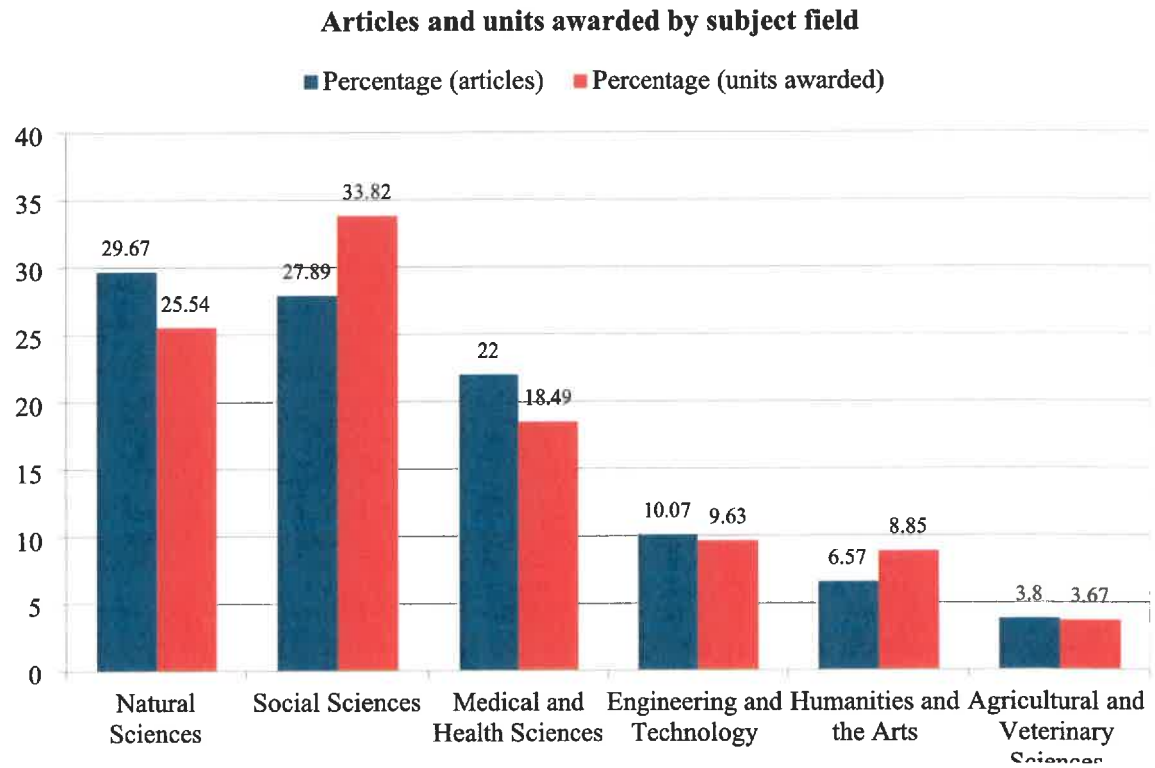


Figure 7: Comparing the number of articles units awarded with articles by the main subject field

4. BOOK AND BOOK CHAPTER OUTPUTS

4.1. Overview and trends

Research publication units in scholarly books for 2024 amounted to 3 110.9 units, an increase of 120.3 units from 2990.6 units in 2023 (a 4.02% increase). The longer-term trend of book publication outputs is presented in **Figure 8**. The trend in output in this category over the past 20 years is interesting. The steep increase in 2016 is most likely due to the increase in the monetary value assigned to book subsidy units introduced in the revised 2015 Research Output Policy. Since then, the annual increase has remained reasonably stable, although the smaller numbers produce year-on-year fluctuations. The decline from 2022 to 2023 was a short-term phenomenon, possibly influenced by COVID-19 disruptions (delayed publications, shifted priorities to online teaching), and the Department has also become stricter in not awarding subsidies to publishing which have been deemed to be predatory or vanity and self-publishing.

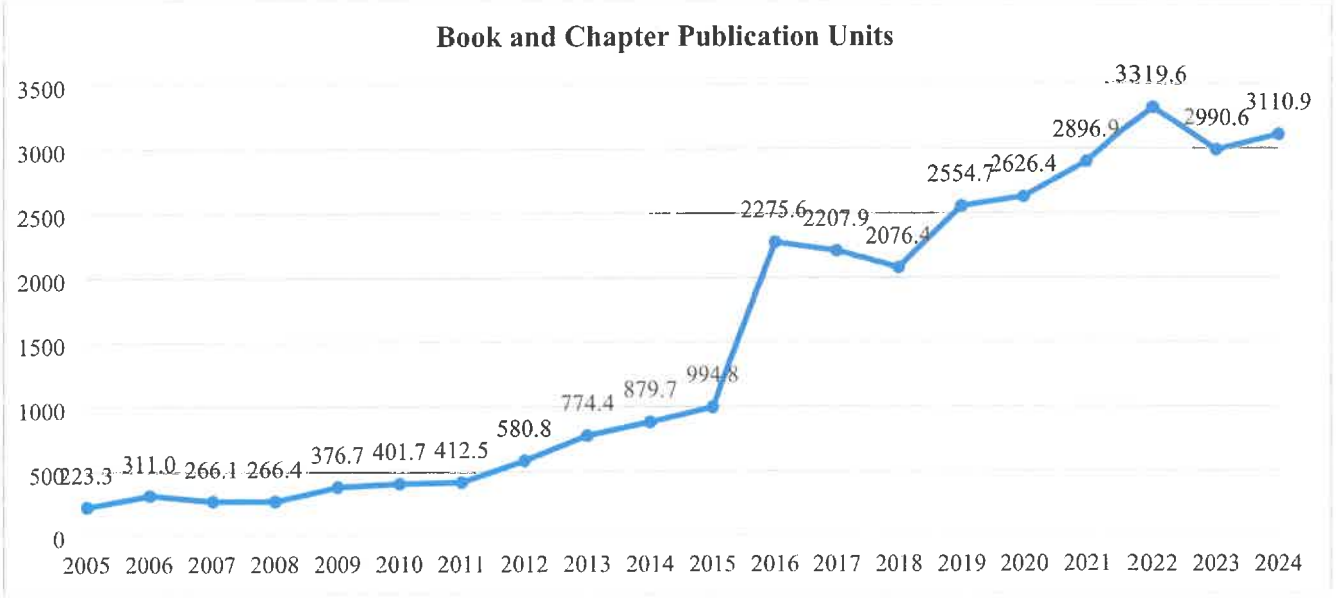


Figure 8: Trend in book and book chapter output from 2005 to 2024

The growth in book publications over the years is illustrated by the CAGR values for three-year window periods from 2005, as shown in **Table 5**. The highest CAGRs were recorded in 2016 and 2017. These two years followed the introduction of the doubling of the monetary value awarded to books in the 2015 new policy. The overall sector total grew from 994.77 units (2015) to 3,110.90 units (2024), a 3.13× increase (CAGR of 13.51% per year). This reflects deliberate policy encouragement for book outputs (via higher subsidy rewards) and institutional efforts to diversify beyond journals.

Table 5: CAGR by rolling three-year windows for books and chapters, 2007-2024

Year	Books & Chapter Units	Annual Growth	3Yr CAGR
2005	223.3		
2006	311.0	39.27%	
2007	266.1	-14.44%	
2008	266.4	0.11%	6.06%
2009	376.7	41.40%	6.60%
2010	401.7	6.64%	14.71%
2011	412.5	2.69%	15.69%
2012	580.8	40.80%	15.53%
2013	774.4	33.33%	24.46%
2014	879.7	13.60%	28.72%
2015	994.8	13.08%	19.65%
2016	2275.6	128.75%	43.23%
2017	2207.9	-2.98%	35.90%
2018	2076.4	-5.96%	27.80%
2019	2554.7	23.04%	3.93%
2020	2626.4	2.81%	5.96%
2021	2896.9	10.30%	11.74%
2022	3319.6	14.59%	9.12%
2023	2990.6	-9.91%	4.42%
2024	3110.9	4.02%	2.40%
CAGR (2005-2024)	14.87%		

In 2024, book publications constituted 12% of overall publication units, compared with journal articles, which accounted for 83.6% of all outputs, and conference proceedings (4.4%) constituted the remainder.

4.2. Book and book chapter outputs by university

The distribution of book publications units by university for the past two years is presented in **Table 6**.

Table 6: Percentage of book publications output units by university, 2023 and 2024

	2023		2024			
Institution	**No. of Units**	**% of Total**	**No. of Units**	**% of Total**	**Difference (year to year)**	**% Growth**
CPUT	21.718	0.73%	25.482	0.82%	3.764	17.33%
CUT	9.165	0.31%	25.616	0.82%	16.451	179.51%
DUT	39.822	1.33%	67.947	2.18%	28.125	70.63%
MUT	1.706	0.06%	4.625	0.15%	2.919	171.13%
NMU	56.778	1.90%	49.752	1.60%	-7.026	-12.37%
NWU	276.754	9.25%	226.592	7.28%	-50.163	-18.13%
RU	46.841	1.57%	57.861	1.86%	11.019	23.52%
SMU	2.526	0.08%	0.210	0.01%	-2.317	-91.70%
SPU	11.611	0.39%	5.858	0.19%	-5.753	-49.55%
SUN	364.270	12.18%	309.480	9.95%	-54.791	-15.04%
TUT	12.989	0.43%	23.880	0.77%	10.890	83.84%
UCT	132.874	4.44%	134.932	4.34%	2.058	1.55%
UFH	15.594	0.52%	48.617	1.56%	33.023	211.78%
UFS	266.681	8.92%	318.978	10.25%	52.296	19.61%
UJ	463.914	15.51%	483.162	15.53%	19.247	4.15%
UKZN	261.889	8.76%	208.613	6.71%	-53.275	-20.34%
UL	12.965	0.43%	42.302	1.36%	29.336	226.27%
UMP	6.935	0.23%	5.632	0.18%	-1.303	-18.78%
UNISA	237.377	7.94%	274.606	8.83%	37.229	15.68%
UNIVEN	27.759	0.93%	20.815	0.67%	-6.944	-25.02%
UNIZULU	26.704	0.89%	26.030	0.84%	-0.674	-2.53%
UP	290.099	9.70%	285.784	9.19%	-4.315	-1.49%
UWC	112.166	3.75%	150.152	4.83%	37.986	33.87%
VUT	15.417	0.52%	25.289	0.81%	9.872	64.03%
WITS	254.880	8.52%	268.202	8.62%	13.321	5.23%
WSU	21.162	0.71%	20.488	0.66%	-0.674	-3.18%
TOTAL	**2990.596**	100.00%	**3110.900**	100.00%	120.304	4.02%

The longer-term trend in the production of books and book chapters by university is presented in **Table 7**. The table is organized in descending order of the CAGR-values. Institutions moving from a relatively low base and experiencing significant growth tend to have higher CAGRs, particularly in

many historically disadvantaged or emerging institutions. (WSU, CUT, UFH, UL, TUT and UNIZULU)

In 2024, seven universities (UJ, UFS, SUN, UP, UNISA, WITS, NWU and UKZN) account for 76.4% of sectoral book units, which again demonstrates how unequal the output in all categories has become.

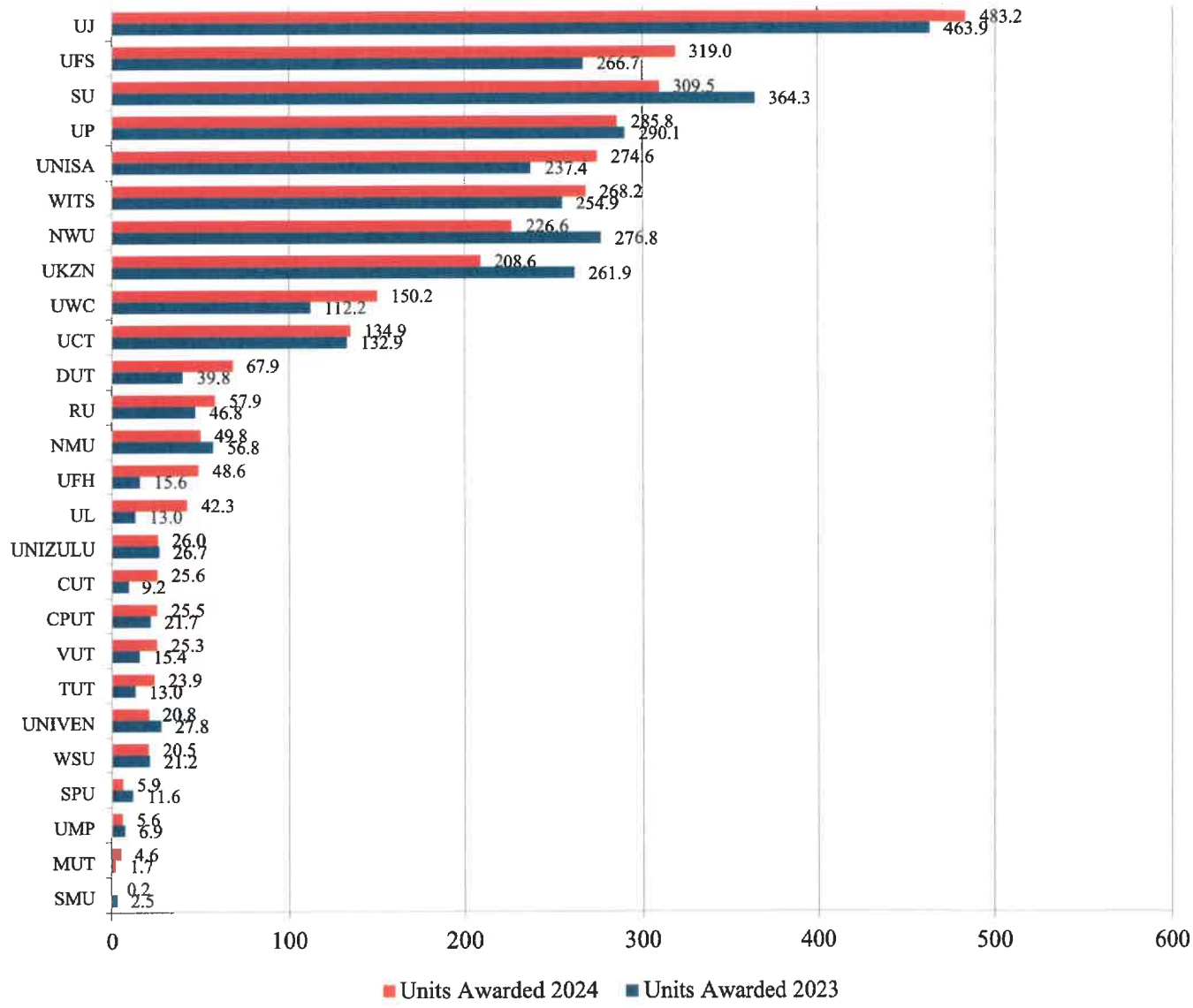
Table 7: CAGR of book publications units by university, 2015 - 2024

Institution	2015	2020	2023	2024	Annual Growth	CAGR (2015-2024)
WSU	0.08	12.78	21.16	20.49	-3.18%	85.18%
CUT	1.11	4.64	9.16	25.62	179.51%	41.73%
UFH	2.99	11.00	15.59	48.62	211.78%	36.32%
UL	3.66	13.22	12.97	42.30	226.27%	31.25%
TUT	3.02	0.39	12.99	23.88	83.84%	25.83%
UNIZULU	4.52	16.18	26.70	26.03	-2.53%	21.47%
UJ	92.37	344.64	463.91	483.16	4.15%	20.18%
UWC	29.34	32.24	112.17	150.15	33.87%	19.89%
NMU	10.05	67.06	56.78	49.75	-12.37%	19.45%
NWU	48.84	233.43	276.75	226.59	-18.13%	18.59%
CPUT	5.99	12.30	21.72	25.48	17.33%	17.45%
DUT	16.59	48.40	39.82	67.95	70.63%	16.96%
UFS	79.08	320.68	266.68	318.98	19.61%	16.76%
SUN	78.00	444.45	364.27	309.48	-15.04%	16.55%
UNISA	71.79	149.92	237.38	274.61	15.68%	16.07%
UKZN	66.47	131.22	261.89	208.61	-20.34%	13.55%
UP	101.10	301.06	290.10	285.78	-1.49%	12.24%
UNIVEN	10.80	12.63	27.76	20.81	-25.02%	7.56%
WITS	159.40	235.21	254.88	268.20	5.23%	5.95%
RU	48.10	54.53	46.84	57.86	23.52%	2.07%
UCT	161.47	165.61	132.87	134.93	1.55%	-1.98%
MUT	0.00	0.42	1.71	4.63	64.03%	
SMU	0.00	1.00	2.53	0.21	-49.55%	
SPU	0.00	2.29	11.61	5.86	-18.78%	
UMP	0.00	2.95	6.93	5.63	171.13%	
VUT	0.00	8.15	15.42	25.29	-91.70%	

Institution	2015	2020	2023	2024	Annual Growth	CAGR (2015-2024)
TOTAL	994.77	2626.40	2990.60	3110.90	4.02%	13.51%

In **Figure 9** below, we compare the changes in units awarded for the two most recent years by university.

Figure 9: Comparing book and book chapter units awarded for 2023 and 2024 by university



5. PUBLISHED CONFERENCE PROCEEDINGS

5.1. Overview and trends

The trend line of published conference proceedings (**Figure 10**) shows frequent year-on-year fluctuations due to smaller sample sizes. The inclusion of additional indexes (most notably Scopus in 2015) accounts for the increase in proceeding units from around 2012 to 2013 and then again from around 2019. During this period, the units remained stable at around 1300 units per year. The decline from 2019 to 2020 reflects stricter controls on submitted claims and the pandemic's disruption of in-person scholarly events. Since 2020, we have witnessed a steep increase in former average values, likely due to the widespread adoption of virtual/hybrid conferences.

Figure 10: Trends in the production of published conference proceedings between 2005 and 2024

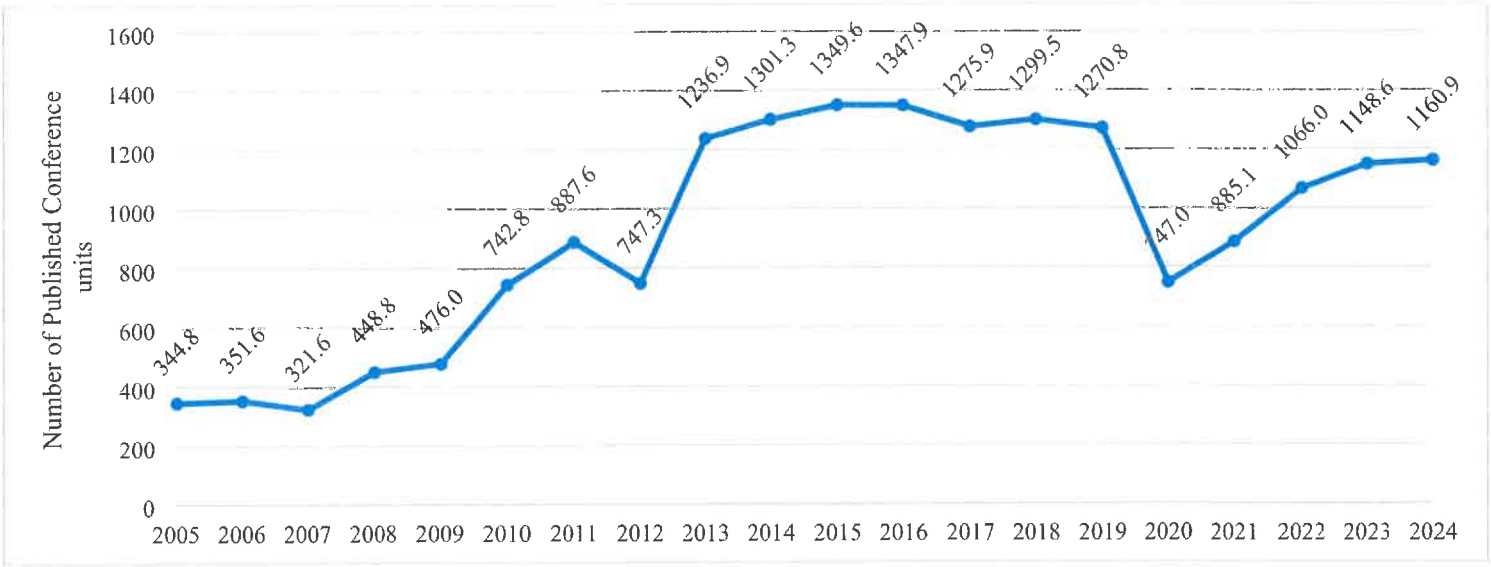


Table 8 presents the CAGR values for the corresponding timeframes. The overall sector output is categorised in three distinct periods: Strong pre-2015 growth, 2020 collapse (−44.6%), then recovery to near pre-pandemic levels but with negative long-term CAGR (−2.00%) from 2015–2024, indicating the pandemic shock, stricter quality controls on submitted claims, and slower rebound prevented full return to 2015 highs on a compound basis. Recent year-on-year growth (2023–2024) is a modest +1.08%.

Table 8: CAGR values for growth rates in annual published conference proceedings (2005 to 2024)

Year	Conference Proceedings Units Awarded	Annual Rate of Growth	3Yr CAGR
2005	344.8		
2006	351.6	1.97%	
2007	321.6	-8.53%	
2008	448.8	39.55%	9.18%
2009	476	6.06%	10.62%

Year	Conference Proceedings Units Awarded	Annual Rate of Growth	3Yr CAGR
2010	742.8	56.05%	32.19%
2011	887.6	19.49%	25.52%
2012	747.3	-15.81%	16.22%
2013	1236.9	65.52%	18.53%
2014	1301.3	5.21%	13.60%
2015	1349.6	3.71%	21.78%
2016	1347.9	-0.13%	2.91%
2017	1275.9	-5.34%	-0.65%
2018	1299.5	1.85%	-1.25%
2019	1270.8	-2.21%	-1.94%
2020	747	-41.22%	-16.34%
2021	885.0543	18.48%	-12.02%
2022	1066.0406	20.45%	-5.69%
2023	1148.6184	7.75%	15.42%
2024	1160.9385	1.07%	9.47%
CAGR	**6.60%**		

The compound growth rate of published and approved conference proceedings units per institution, for the past 10 years, is summarised in **Table 9**. Conference publications have consistently accounted for the smallest share of all publications (4.47% in 2024).

Table 9: Published Conference Proceedings Units per university, 2015 – 2024

Institution	Units per year					
	2015	2020	2023	2024	Annual Growth	CAGR
UJ	288.4	173.7	280.0605	248.8798	-11.13%	**-0.37%**
UNISA	87.7	37.7	64.7582	112.1905	73.25%	**-3.72%**
WITS	86.4	50.8	55.1417	88.4455	60.40%	**-5.46%**
NWU	126.8	38.8	106.4453	88.4084	-16.94%	**-2.16%**
SUN	82.6	74.6	116.7080	86.9579	-25.49%	**4.42%**
UP	151	49.1	96.4104	78.3202	-18.76%	**-5.45%**
DUT	31.8	30.1	53.9923	60.6373	12.31%	**6.84%**
TUT	44.4	22.1	49.6726	55.1715	11.07%	**1.41%**
UCT	102.6	63	66.3391	50.1719	-24.37%	**-5.30%**
CUT	30.9	38.8	27.3495	32.3255	18.19%	**-1.51%**

UFS	46.3	31.3	28.4332	31.5499	10.96%	**-5.91%**
NMU	63.6	24.9	27.4165	29.5249	7.69%	**-9.98%**
UKZN	51.2	29.2	38.6386	29.0930	-24.70%	**-3.46%**
CPUT	33.4	18.3	22.5419	25.7834	14.38%	**-4.80%**
VUT	13.3	14.7	20.1665	24.4999	21.49%	**5.34%**
WSU	2.5	9.5	12.1084	24.0000	98.21%	**21.80%**
RU	34.6	6.1	19.9584	19.5666	-1.96%	**-6.65%**
UWC	6.8	10.9	14.4086	17.4970	21.43%	**9.84%**
UL	33	7.4	16.7292	14.8832	-11.03%	**-8.14%**
UNIZULU	11.3	6.9	12.1678	14.4427	18.70%	**0.93%**
UFH	8.9	2	5.3500	7.5000	40.19%	**-6.16%**
SPU	0	3	3.5118	6.4466	83.57%	
MUT	1.3	1.3	1.2644	5.5000	334.99%	**-0.35%**
UNIVEN	9.1	1.2	6.3834	4.6846	-26.61%	**-4.34%**
UMP	0	0.4	0.0000	2.4166	0.00%	
SMU	1.5	1.2	2.6083	2.0416	-21.73%	**7.16%**
TOTAL	**1349.6**	**747**	**1148.5646**	**1160.9385**	1.08%	**-2.00%**

The percentage share of total conference publications for 2024 for the sector is presented in **Figure 11**. Conference proceedings are dominant in applied sciences, engineering, and computing — universities strong in these fields (e.g., Universities of Technology and STEM-focused universities) may sustain higher output.

Published Conference Proceeding units awarded by university

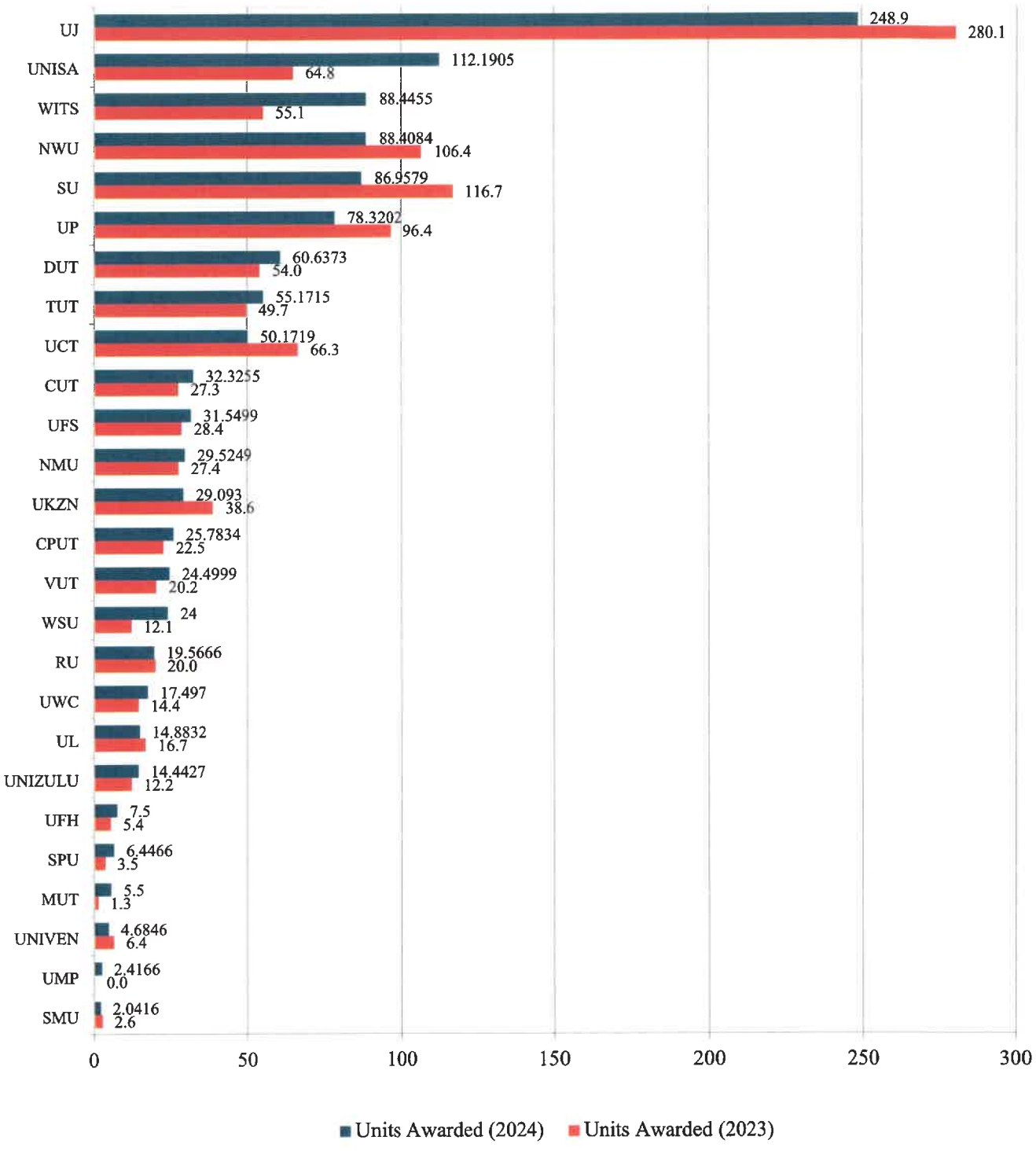


Figure 11: Comparison of conference proceeding units awarded for 2023 and 2024 by university

6. NORMALISED RESEARCH OUTPUT INDICATORS

The results presented in this Report thus far represent absolute numbers of subsidy units awarded, irrespective of the size and knowledge-productive capacity of the respective universities. In this section, we report on four indicators, normalised to enable a fairer comparison of the 'research performance' of South African universities.

- *Per capita research publication output* - the total number of publications (all document types) by a university is divided by the headcount of the permanently employed instructional and research staff.
- *Normalised Weighted per capita research output* - the sum of the total number of publications (all document types) together with the number of research master's graduates and doctoral graduates (weighted by a factor of 3) produced is divided by the headcount of the permanently employed instructional and research staff.

The first two indicators can be interpreted as proxy indicators of the research publication intensity and research intensity of South African universities, respectively[8].

The third indicator – the percentage of academic staff with doctoral degrees – can be interpreted as a proxy for doctoral quality at a university. The fourth indicator included here is defined as 'the ratio of doctoral graduates to doctoral academic staff', which can be interpreted as a research productivity measure.

6.1. Per capita research publication output

The average per capita research publication output for all universities in 2024 was 1.24 units, up from 1.14 units in the previous year **(Table 10)**. This means that the average permanently employed academic in the sector produced just more than one research publication unit in 2024, equivalent to a peer-reviewed journal article or a research master's graduate. Academics at nine universities (UJ, UKZN, UP, SUN, UFS, WITS, RU, UNISA, and UCT) on average produced research publications above the sector average. The table reveals a clear stratification in South African higher education research productivity: A small group of high-performing universities drives a disproportionate share of national research output per staff member.

[8] It is important to note that the first indicator is referred to as the per capita **publication** output and the second as the weighted per capita **research** output, as the latter combines publications with the production of post-graduate students as forms of research output.

Table 10: Per capita research publications outputs, 2024

Institution	Headcount of permanently employed academics	Research Publications Units	Per Capita Research Publications Units
	(A)	(B)	(B/A)
UJ	1384.00	3512.69	2.54
UKZN	1178.00	2107.10	1.79
UP	1200.00	2078.54	1.73
SUN	1298.00	2168.59	1.67
UFS	909.00	1452.53	1.60
WITS	1332.00	2006.10	1.51
RU	359.00	496.03	1.38
UNISA	1942.00	2608.35	1.34
UCT	1204.00	1541.76	1.28
Sector Average		**1.24**	
UFH	298.00	358.06	1.20
NWU	1696.00	1870.40	1.10
UWC	702.00	748.54	1.07
UNIZULU	340.00	328.32	0.97
DUT	689.00	663.39	0.96
UL	728.00	662.30	0.91
CUT	327.00	283.24	0.87
TUT	849.00	606.34	0.71
NMU	726.00	484.33	0.67
VUT	319.00	204.52	0.64
WSU	910.00	555.06	0.61
UNIVEN	510.00	303.52	0.60
SMU	569.00	336.06	0.59
SPU	157.00	88.83	0.57
UMP	209.00	94.51	0.45
CPUT	813.00	341.99	0.42
MUT	239.00	80.64	0.34

6.2. *Weighted per capita research output*

The weighted per capita research output indicator sums the publications in all categories (journal articles, books, book chapters and published conference proceedings) with the number of research master's graduates and doctoral graduates and divides the total research publication output units by the headcount of permanently employed academic (instructional and research) staff at a university. This weighted per capita view provides a more holistic picture of research performance than publications alone, emphasising not just output volume but also high-level skills development via master's and especially doctorate graduates.

The results, as presented in **Table 11,** show that the average weighted per capita research output across all universities in 2024 was 2.23, up from 2.07 in 2023. Eleven universities (UP, UJ, UKZN, SUN, WITS, UCT, UFS, UWC, UFH, RU, and UNISA) recorded scores above the sector average. This is an increase from only eight universities in 2023.

Table 11: Weighted per capita research output (2024)

Institution	Headcount of permanently employed academics	Research Publications Units	Research Masters Graduates Units	Doctoral Graduates Units	Total Weighted Output Units (1+2+3)	Normalised weighted output (1+2+3)/A
	(A)	-1	-2	-3		
UP	1200	2078.54	1203.75	1245	4527.29	3.77
UJ	1384	3512.69	974.33	497.33	4984.35	3.60
UKZN	1178	2107.10	691.97	1305	4104.07	3.48
SUN	1298	2168.59	937.71	984	4090.30	3.15
WITS	1332	2006.10	1011.53	1083	4100.63	3.08
UCT	1204	1541.76	728.19	867	3136.94	2.61
UFS	909	1452.53	418.42	489	2359.95	2.60
UWC	702	748.54	390.00	591	1729.54	2.46
UFH	298	358.06	166.36	189	713.42	2.39
RU	359	496.03	122.20	228	846.23	2.36
UNISA	1942	2608.35	617.65	1320	4546.00	2.34
Sector Average						**2.23**
NWU	1696	1870.40	566.05	831	3267.44	1.93
UNIZULU	340	328.32	106.31	165	599.63	1.76
DUT	689	663.39	183.98	351	1198.37	1.74
CUT	327	283.24	77.00	141	501.24	1.53
TUT	849	606.34	275.25	315	1196.59	1.41
UL	728	662.30	256.97	79.5	998.77	1.37

NMU	726	484.33	221.84	198	904.17	1.25
UNIVEN	510	303.52	41.00	121.5	466.02	0.91
VUT	319	204.52	35.00	33	272.52	0.85
WSU	910	555.06	84.84	51	690.90	0.76
UMP	209	94.51	54.00	3	151.51	0.72
SMU	569	336.06	59.79	16.5	412.35	0.72
CPUT	813	341.99	112.00	123	576.99	0.71
SPU	157	88.83	19.50	0	108.33	0.69
MUT	239	80.64	0.00	0	80.64	0.34

Figure 12 presents the trend in the values of the two normalised indicators (**per capita research publication output** and the **weighted per capita research output** of the past 20 years. The results show that the HE sector has consistently improved its research performance over this period. South African universities have more than doubled both their average publication and research output from 2005 to 2024.

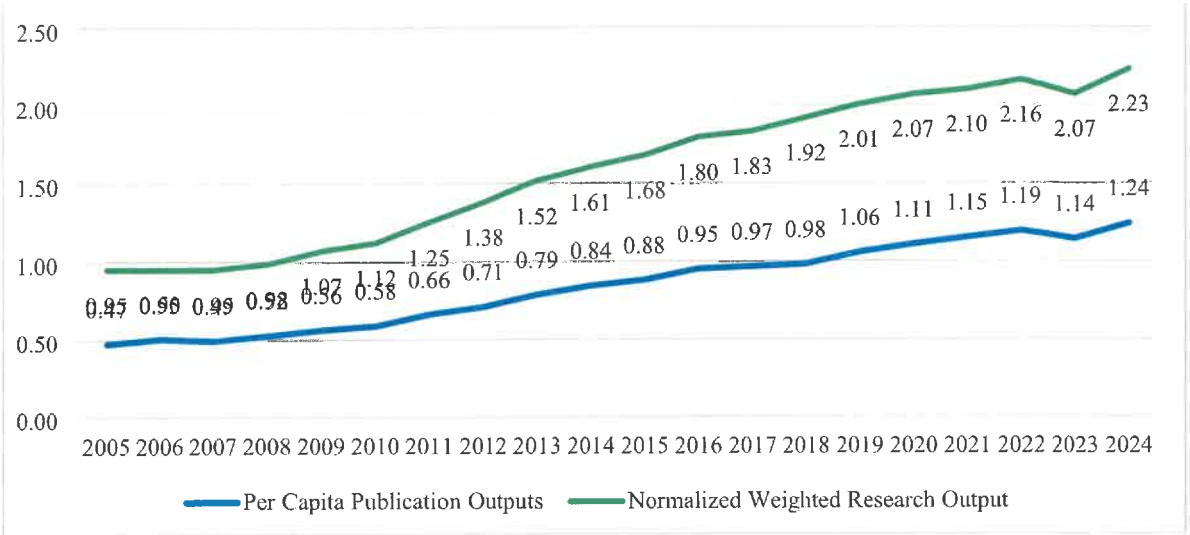


Figure 6: Trend in Per Capita Publications Output and Weighted Research and Normalised Weighted Research Output 2005 – 2024

6.3. Proportion of academic staff with doctorates

The proportion of academic staff with doctorates is generally used as a proxy for the 'quality' of academic staff. It is also an indicator that correlates strongly with a university's research publication output. Over the years, it has been shown that universities with a higher proportion of academics with doctoral degrees are typically more research-active than other institutions with a smaller percentage of doctoral staff.

Table 12 presents the data of permanently employed academics by their highest qualifications in the reporting year of 2024 (The percentage of staff with a doctorate as the highest qualification per university is arranged in descending order from highest to lowest). The average number of academics

with a doctorate as the highest qualification in the sector in 2024 was 56%, an increase from 53.8% in 2023.

Table 12: Number of permanently employed academics by highest qualification, 2024

Institution	Total Instructional/ Research Staff	Academics with Doctorate as Highest Qualifications		Weighted Research Output Units
		Headcount	% of Institutional Total Academics	
UP	1200	906	75.50%	4527.29
SUN	1298	908	69.95%	4090.30
UWC	702	485	69.09%	1729.54
WITS	1332	919	68.99%	4100.63
RU	359	236	65.74%	846.23
UKZN	1178	758	64.35%	4104.07
UNISA	1942	1229	63.29%	4546.00
UFS	909	574	63.15%	2359.95
UCT	1204	755	62.71%	3136.94
UJ	1384	862	62.28%	4984.35
SPU	157	97	61.78%	108.33
NWU	1696	1002	59.08%	3267.44
Sector Average			55.99%	
UNIZULU	340	185	54.41%	599.63
UFH	298	146	48.99%	713.42
UMP	209	102	48.80%	151.51
NMU	726	347	47.80%	904.17
UNIVEN	510	232	45.49%	466.02
CUT	327	142	43.43%	501.24
UL	728	299	41.07%	998.77
TUT	849	341	40.16%	1196.59
CPUT	813	325	39.98%	576.99
DUT	689	251	36.43%	1198.37
SMU	569	185	32.51%	412.35
WSU	910	272	29.89%	690.90
MUT	239	62	25.94%	80.64
VUT	319	75	23.51%	272.52
Total or Average	**20887**	**11695**	**55.99%**	**46564.19**

The sector average of ~56% PhD-qualified permanent academics represents progress but falls short of ambitions (e.g., the National Development Plan (NDP) targets ~70% by 2030 to support knowledge economy goals).

Figure 13 presents the time series data of academics with a doctorate as the highest qualification in the sector for the period 2005 to 2024. The overall trend has been a consistent, linear increase in the percentage of staff with doctoral degrees, from about 30% of all staff holding a PhD in 2005 to the latest figure of 56%. The 'dip' in 2021 may be due to several factors: natural retirement cycles, staff appointments without doctorates replacing doctorate staff, and so on. Further analysis of this trend is currently underway in the PQFP.

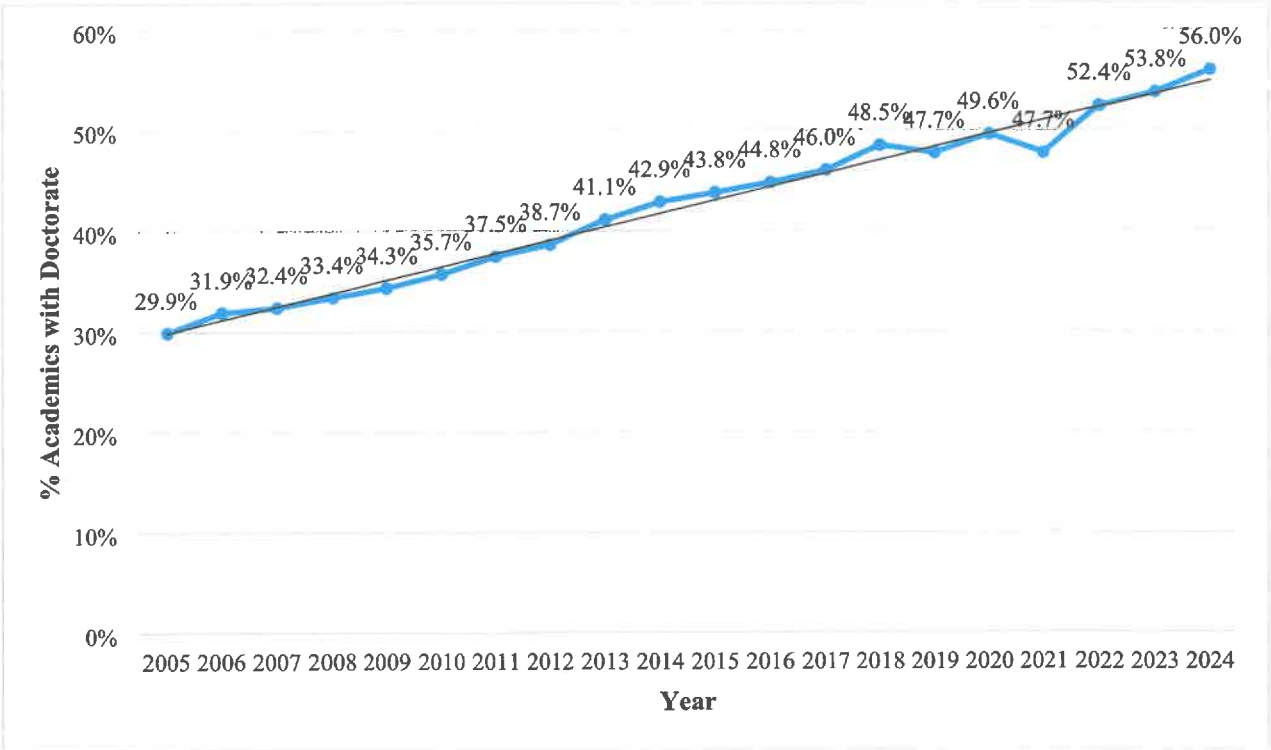


Figure 13: Trend in percentage of staff with doctorate degrees from 2005 to 2024.

6.4. Ratio of doctoral graduates to academics with a doctorate

The final indicator we report on is research productivity, specifically the production of highly skilled and doctoral graduates. The ratio of doctoral graduates to academics with a doctoral degree as the highest qualification is calculated as the number of registered doctoral candidates divided by the number of academics with a doctoral degree as the highest qualification at a university. **Table 13** shows that the sector average of academics with doctorates and doctoral candidates in 2024 was 0.32%.

Table 13 presents an analysis of the ratio of doctoral graduates per permanent doctoral academic by university. In 2024, eleven universities recorded values above the national average, up from only eight universities in 2022.

Table 13: Ratio of doctoral graduates to doctorate staff member by university (2024)

Institution	Number of academics with Doctorate	Number of Doctoral graduates	Ratio
UKZN	758	435	0.574
DUT	251	117	0.466
UP	906	415	0.458
UFH	146	63	0.432
UWC	485	197	0.406
WITS	919	361	0.393
UCT	755	289	0.383
SUN	908	328	0.361
UNISA	1229	440	0.358
CUT	142	47	0.331
RU	236	76	0.322
Sector Average			**0.320**
TUT	341	105	0.308
UNIZULU	185	55	0.297
UFS	574	163	0.284
NWU	1002	277	0.276
UJ	862	166	0.192
NMU	347	66	0.190
UNIVEN	232	41	0.175
VUT	75	11	0.147
CPUT	325	41	0.126
UL	299	27	0.089
WSU	272	17	0.063
SMU	185	6	0.030
UMP	102	1	0.010
MUT	62	0	0.000
SPU	97	0	0.000

The ratio of doctoral graduates to academics with doctorates as their highest qualification can serve as a proxy for 'supervisory carrying load'. The ratio refers to the number of doctoral candidates per supervisor per academic year. However, the ratio used above does not provide an accurate overview of the **overall supervisory carrying load** as it excludes research master's graduates. The simple ratio, as applied above, only factors in headcount graduates and not the units. The use of units is much more accurate, particularly in the case of doctoral graduates, who are weighed by a factor of 3. Therefore, a more accurate calculation would include research master's graduates and make use of units rather than

the actual number of graduates (which does not distinguish between master's and doctoral graduates). **Table 14** combines all the above elements and presents the supervisory carrying capacity per institution in 2024.

Table 14: Supervisory load per doctorate academic staff by university (2024)

Institution	Research Graduates Output Units			Academics with Doctorate as Highest Qualifications		Supervisory Capacity = Ratio (C/D)
	Masters units (A)	Weighted Doctoral units (B)	Total M+D units (C)	Headcount (D)	% of Institutional Total Academics	
UP	1203.75	1245.00	2448.75	906	74.7%	2.70
UKZN	691.965	1305.00	1996.97	758	62.4%	2.63
UFH	166.36	189.00	355.36	146	50.5%	2.43
WITS	1011.53	1083.00	2094.53	919	70.0%	2.28
DUT	183.98	351.00	534.98	251	36.9%	2.13
SUN	937.71	984.00	1921.71	908	65.5%	2.12
UCT	728.186	867.00	1595.19	755	62.6%	2.11
UWC	390	591.00	981.00	485	62.5%	2.02
Sector Average						**1.76**
TUT	275.245	315.00	590.25	341	39.1%	1.73
UJ	974.334	497.33	1471.67	862	59.3%	1.71
UFS	418.42	489.00	907.42	574	59.6%	1.58
UNISA	617.647	1320.00	1937.65	1229	60.7%	1.58
CUT	77	141.00	218.00	142	42.7%	1.54
RU	122.2	228.00	350.20	236	63.4%	1.48
UNIZULU	106.306	165.00	271.31	185	49.8%	1.47
NWU	566.048	831.00	1397.05	1002	57.4%	1.39
NMU	221.84	198.00	419.84	347	46.7%	1.21
UL	256.97	79.50	336.47	299	39.3%	1.13
VUT	35	33.00	68.00	75	23.9%	0.91
CPUT	112.001	123.00	235.00	325	34.5%	0.72
UNIVEN	41	121.50	162.50	232	46.4%	0.70
UMP	54	3.00	57.00	102	48.5%	0.56
WSU	84.842	51.00	135.84	272	28.5%	0.50
SMU	59.79	16.50	76.29	185	25.9%	0.41

Institution	Research Graduates Output Units			Academics with Doctorate as Highest Qualifications		Supervisory Capacity = Ratio (C/D)
	Masters units (A)	Weighted Doctoral units (B)	Total M+D units (C)	Headcount (D)	% of Institutional Total Academics	
SPU	19.5	0.00	19.50	97	66.9%	0.20
MUT	0	0.00	0.00	62	26.1%	0.00
Total	**9355.62**	**11226.83**	**20582.46**	**11695.00**	**56.0%**	**1.76**

7. DEMOGRAPHIC TRENDS

7.1. Publication outputs by the gender of author

The Department gathers demographic information on all authors to monitor national trends in support of the transformation of higher education in South Africa. Such information is required to assist the Department as well as individual universities in doing better planning and policy development. There has been steady improvement in the quality and reliability of the data since the Department began collecting biographical data about 8 years ago.

Figure 14 presents the trend by gender in the sector's overall publication outputs since 2005. The figure shows that the contribution of female academics rose to about 44.6% in 2023, then declined to 43.75% in 2024. As noted before, the growth of publications by women must be read against the background of increased female enrolment in the sector over the past two decades.

It is also important to compare this statistic with the actual percentage of women academics (permanent instructional and research staff) in the sector. In 2022, female academics constituted 55% of all permanent staff, indicating that a gap remains between the available capacity and the actual research output of female academics at SA's universities.

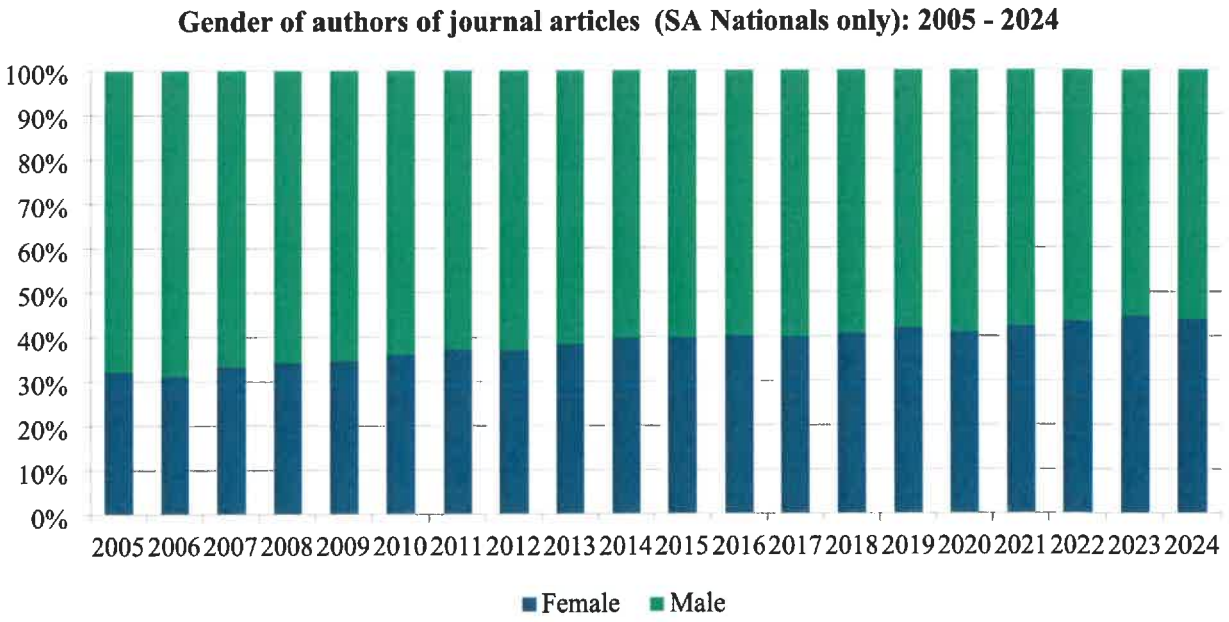


Figure 14: Gender of authors of journal articles: 2005 - 2024

7.2. Publication outputs by country of birth of the author

The focus of this demographic indicator is on establishing trends in the contributions of South African academics (South African citizens, naturalised citizens, and permanent residents) compared with those of non-South Africans employed at South African universities. The trend exhibited in **Figure 15** shows a decreasing contribution by South African nationals to overall sector output, from 87.5% in 2005 to around 62% in 2018, after which it increased and stabilised at around 64%.

The main conclusion to be drawn from these trends is that South African universities, over time, increasingly relied on non-South African nationals (both those appointed on a temporary basis at the universities and foreign postdoctoral fellows, visiting research fellows, and associates) for their research publication output. The obvious contributions made by non-South African nationals are to be applauded, but the trend also reaffirms the imperative to grow and nurture our own 'timber'.

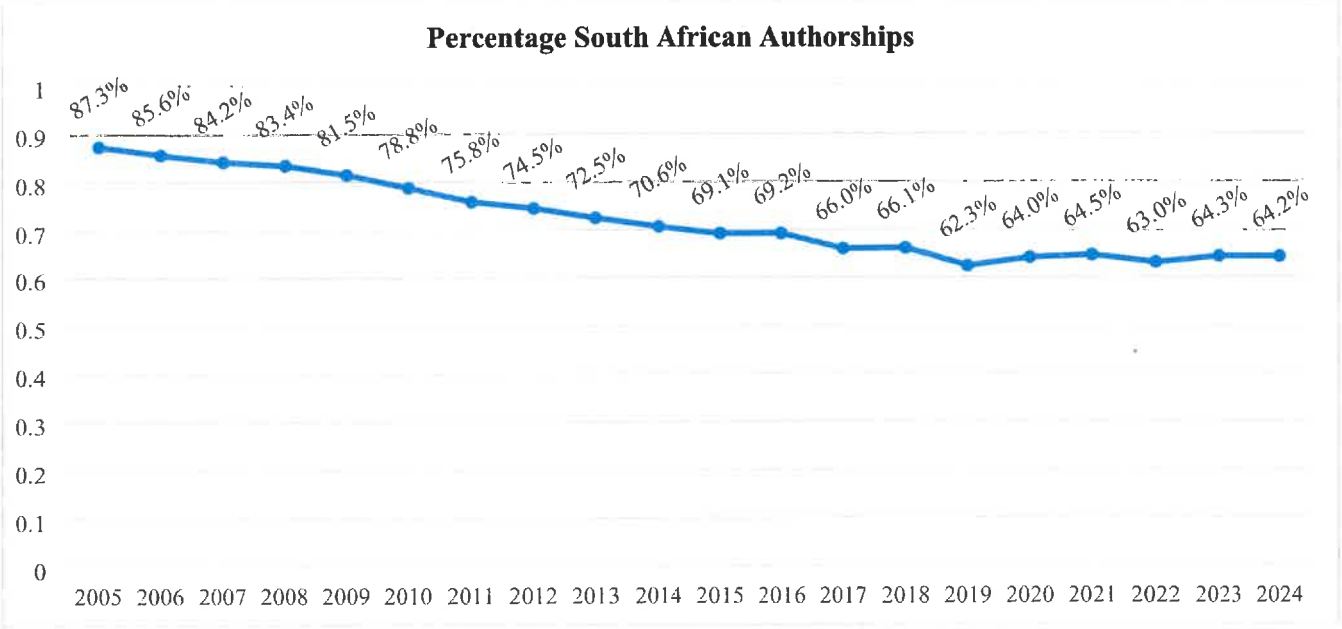


Figure 15: Percentage of authorships produced by South African nationals: 2005 to 2024

7.3. Publication outputs by race of author

Another key variable included in the analysis is the 'race' of the contributing authors, which is confined to South African citizens or permanent residents. According to the Statistics Act of 1996, only South African citizens are classified by population group or race and into four categories: Black African, Coloured, Indian/Asian and White (and reaffirmed by the Employment Equity Act of 1998). The classification by race for purposes of measuring transformation does not apply to non-South African nationals.

All universities are required to provide data to enable the Department to interpret transformation patterns and trends in knowledge production. The reliability and quality of the data on the 'race' of the claiming authors, however, remains problematic and must be improved.

Table 15 illustrates that the transformation of research publications in the HE sector has been one of the most striking successes of post-apartheid higher education transformation: a major rebalancing of journal authorship away from predominantly 'white' authored output toward much greater publication output by Black African, Indian and Coloured contributions.

Table 15: Trend in race of authors of journal articles 2005 to 2024

Race of author	2005	2010	2015	2020	2024
Black African	5,3%	9.4%	14,8%	30.3%	41.2%
Coloured	2,9%	4,5%	5,5%	5,2%	5.1%
Indian/Asian	7,2%	8,9%	9.1%	11,8%	10.2%
White	84,6%	77.2%	70,7%	53.4%	43.6%

Figure 16 below presents the trend in the relative contribution by each of the 'race groups' to overall publication output between 2005 and 2024. The trend shows the increase of the publication contribution by Black (African, Coloured and Indian/Asian) academics, post-doctorates and students to the sector's

knowledge production. The contribution by black academics surpassed 50% of the overall contributions for the first time in 2022, having increased from 15% in 2005 to more than 56% in 2024. Again, it is worth comparing this proportion with the percentage of Black academics at South African universities. In 2022, Black academics constituted 62% of the permanent research and instructional staff. As is the case with the gender distribution, it shows that the publication output – despite a steady and strong increase in proportional contribution – is not yet fully representative of all academics.

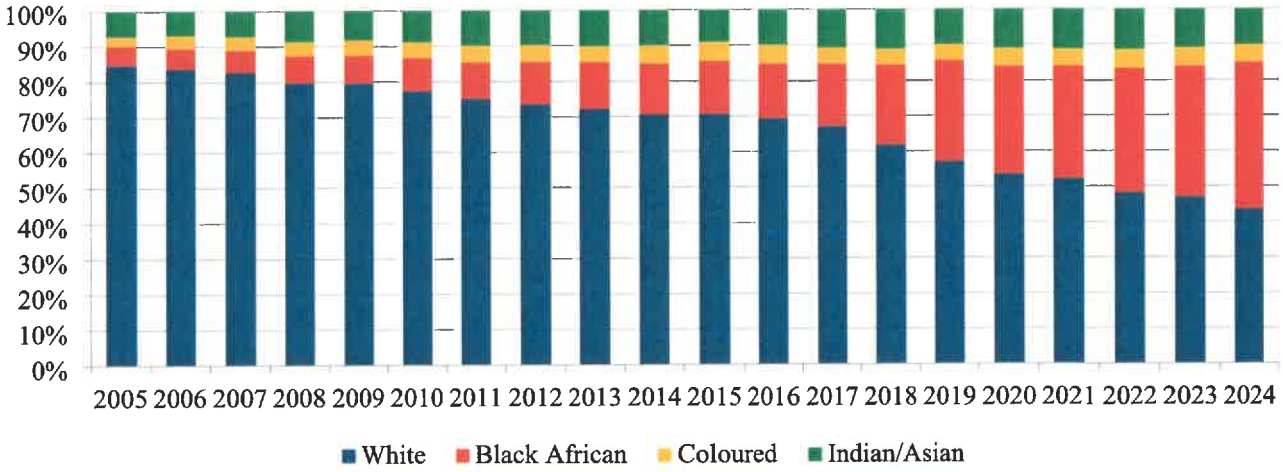


Figure 16: Percentage of authors by race (SA nationals only) between 2005 and 2024

7.4. Publication outputs by the age of author

Figure 17 shows the shifts in the age of authors (age at the date of publication recoded into age intervals) for all publications from 2005 to 2024. This graph aims to illustrate shifts in the average ages of actively publishing academics. This information is important when considering the imperative to build the next generation of academics in South Africa. This means *it is important to track the relative contributions of younger academics over time (under 30, as well as 30-39).* At the same time, the contributions made by older generations should not be ignored or discarded. The older generations not only continue to produce significant numbers of *publications but also play an important role in mentoring the younger generations and in other* forms of research capacity-building.

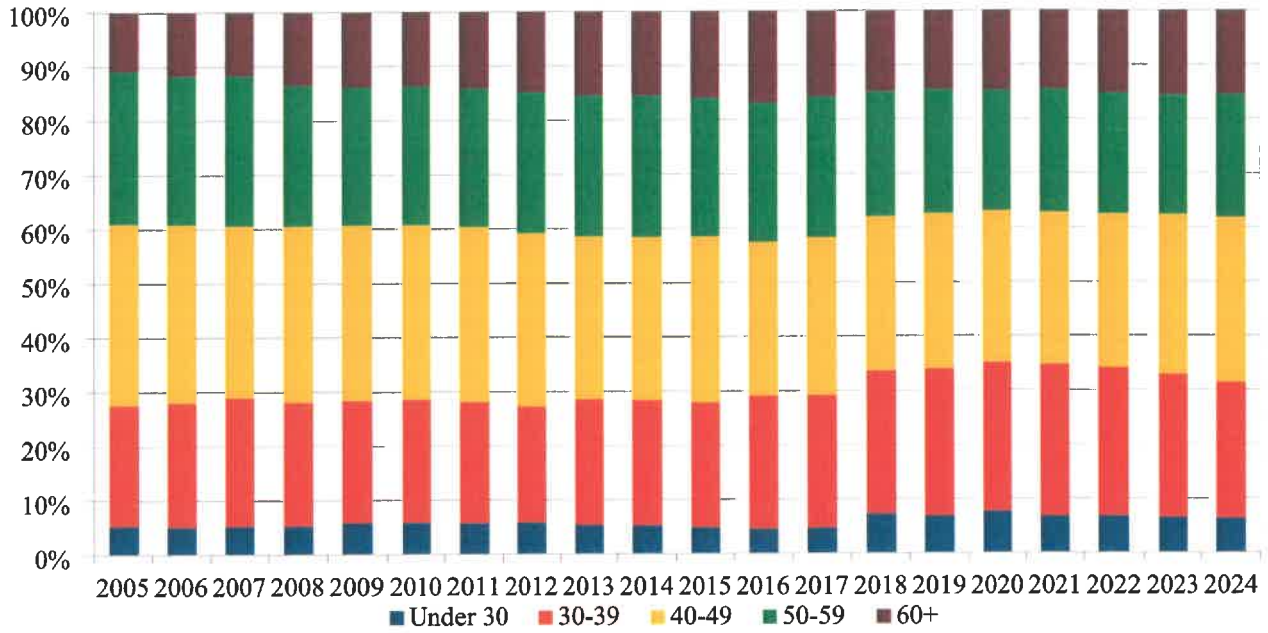


Figure 17: Trend in age of authors, 2005 to 2024

Table 16 drills deeper into the age distribution (in percentage terms) of South African authors of journal articles from 2005 to 2024. Ages are grouped into brackets: Under 30, 30–39, 40–49, 50–59, and 60+.

Dominant age group throughout: The 40–49 bracket consistently holds the largest share (peak ~30–33% in most years), reflecting the typical "prime" career stage for active publishing academics (post-PhD establishment, mid-career productivity). It starts highest in 2005 (33.5%) and remains the modal group every year, though its share gradually declines from the early 2010s (31–33%) to stabilise around 28–30% in recent years (2023–2024: ~29.6–30.5%).

Ageing of the author pool: 60+ share shows a clear long-term increase: from ~10.8% in 2005 to ~15.6% in 2024 (+~4.8 percentage points). Peaks around 2016–2017 (~16.8%), dips slightly mid-2010s–2020, then stabilises at ~15–15.6%. This indicates a maturing research workforce — more senior academics continuing to publish actively (possibly due to extended careers, delayed retirement, or policy incentives for experienced researchers).

Under 30 (early-career/emerging researchers): Remains consistently low (~4.5–7.6%) across the period. Slight dip in mid-2010s (4.5%), then noticeable jump in 2018 (7.2%) and 2020 (~7.6%), followed by stabilisation around 6–7% in recent years (2024: ~6.3%). Net modest increase from 2005 (5.3%) to 2024 (6.3%), but still a small fraction — suggesting limited influx of very young authors into journal publishing (many early-career researchers may focus on conferences, theses, or co-authorship in lower-visibility roles first).

30–39 (early-to-mid career): Volatile early on (e.g., spike to 30–31% in 2008–2009, possibly data quirks or cohort effects), then trends upward from mid-2010s (22–24%) to ~26–28% in recent years (2024: ~25.1%). Reflects growing contributions from mid-career academics, aligning with transformation efforts to build a younger/more diverse pipeline.

50–59 (late-mid career): Declines gradually from ~28% (2005) to ~22–23% in recent years — the mirror image of the 60+ rise and slight 40–49/30–39 gains.

Table 16: Trend in age of authors 2005 to 2024

Year	under 30	30 to 39	40 to 49	50 to 59	60+
2005	5.28%	22.24%	33.48%	28.17%	10.83%
2006	5.04%	22.89%	32.93%	27.45%	11.69%
2007	5.22%	23.63%	31.78%	27.70%	11.66%
2008	5.24%	22.79%	32.54%	25.94%	13.49%
2009	5.80%	22.56%	32.33%	25.54%	13.77%
2010	5.84%	22.68%	32.24%	25.62%	13.62%
2011	5.72%	22.33%	32.33%	25.49%	14.12%
2012	5.79%	21.42%	31.97%	25.95%	14.87%
2013	5.36%	23.17%	30.02%	26.06%	15.39%
2014	5.24%	23.06%	30.14%	26.11%	15.46%
2015	4.86%	22.92%	30.69%	25.54%	15.98%
2016	4.51%	24.51%	28.42%	25.69%	16.87%
2017	4.69%	24.41%	29.15%	25.96%	15.78%
2018	7.24%	26.32%	28.53%	23.02%	14.89%
2019	6.88%	27.01%	28.73%	22.83%	14.55%
2020	7.64%	27.40%	28.07%	22.20%	14.70%
2021	6.77%	27.96%	28.05%	22.69%	14.53%
2022	6.75%	27.34%	28.41%	22.25%	15.25%
2023	6.51%	26.34%	29.56%	22.02%	15.57%
2024	6.33%	25.05%	30.48%	22.61%	15.53%

GENERAL OBSERVATIONS AND CONCLUSIONS

This Report demonstrates that the overall trend of increased output since 2005 (and especially since 2015) continues, but that the growth in output has not been matched by commensurate improvements in quality and adherence to research integrity goals. The Department is aware of the existence and even the increase in unethical practices in the publication of research outputs in the sector. As recommended in the Policy, institutional research integrity committees together with the research offices are urged to put more effort into weeding out unethical practices in research publications and claiming of subsidies. Such practices are better dealt with at the institutional- rather than at the departmental level. The Department has therefore decided to support funding for a national collaborative research project (the PQFP) to investigate these issues and ensure the quality and integrity of university research publications are maintained. However, this does not prevent institutions from taking institution-specific initiatives to decisively address unethical practices in research publications.

The claims identified as unethical were, once again, drawn from the 2024 submissions. Institutional reports provide further detail on this. The Department extends an invitation to engage in dialogues with the affected individual institutions. In this regard, it is also worth reminding institutions that the Department reserves the right to withhold payment of the research output subsidy in respect of claims that do not meet the criteria outlined in the research output policy, and where the Department has found evidence of unethical conduct relating to such claims.

Research subsidies to the higher education sector are an important component of government funding. It is the sector's responsibility to protect this resource by all means possible and ensure it is not vulnerable to abuse or unethical practices. The end goal must be that it remains sustainable and continues to provide continuous impetus to research productivity in the higher education sector. By this Report, the Department hopes to provide a complete mirror of research performance across the sector, albeit reliant on proxies. It is hoped that the universities find it useful in many respects.